AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

S. HRG. 115–112

HEARING ON FOREST MANAGEMENT TO MITIGATE WILDFIRES: LEGISLATIVE SOLUTIONS

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

SEPTEMBER 27, 2017

Printed for the use of the Committee on Environment and Public Works

Available via the World Wide Web: http://www.fdsys.gov

U.S. GOVERNMENT PUBLISHING OFFICE

27–319 PDF WASHINGTON : 2018

For sale by the Superintendent of Documents, U.S. Government Publishing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED FIFTEENTH CONGRESS
FIRST SESSION

JOHN BARRASSO, Wyoming, *Chairman*

JAMES M. INHOFE, Oklahoma
SHELLEY MOORE CAPITO, West Virginia
JOHN BOOZMAN, Arkansas
ROGER WICKER, Mississippi
DEB FISCHER, Nebraska
JERRY MORAN, Kansas
MIKE ROUNDS, South Dakota
JONI ERNST, Iowa
DAN SULLIVAN, Alaska
RICHARD SHELBY, Alabama

THOMAS R. CARPER, Delaware
BENJAMIN L. CARDIN, Maryland
BERNARD SANDERS, Vermont
SHELDON WHITEHOUSE, Rhode Island
JEFF MERKLEY, Oregon
KIRSTEN GILLIBRAND, New York
CORY A. BOOKER, New Jersey
EDWARD J. MARKEY, Massachusetts
TAMMY DUCKWORTH, Illinois
KAMALA HARRIS, California

RICHARD M. RUSSELL, *Majority Staff Director*
GABRIELLE BATKIN, *Minority Staff Director*

C O N T E N T S

Page

SEPTEMBER 27, 2017

OPENING STATEMENTS

Barrasso, Hon. John, U.S. Senator from the State of Wyoming 1
Carper, Hon. Thomas R., U.S. Senator from the State of Delaware 11
Hatch, Hon. Orrin, U.S. Senator from the State of Utah 118
Thune, Hon. John, U.S. Senator from the State of South Dakota 119
Tester, Hon. Jon, U.S. Senator from the State of Montana 120
Daines, Hon. Steve, U.S. Senator from the State of Montana 121

WITNESSES

Crowder, Jessica, Policy Advisor, Office of Governor Matthew H. Mead 124
Prepared statement 126
Responses to additional questions from:
Senator Barrasso 138
Senator Carper 139
Fite, Lawson, General Counsel, American Forest Resources Council 141
Prepared statement 143
Responses to additional questions from:
Senator Barrasso 152
Senator Carper 154
O'Mara, Collin, President and Chief Executive Officer, National Wildlife Federation 156
Prepared statement 159
Responses to additional questions from:
Senator Barrasso 165
Senator Carper 166
Senator Whitehouse 171

HEARING ON FOREST MANAGEMENT TO MITIGATE WILDFIRES: LEGISLATIVE SOLUTIONS

WEDNESDAY, SEPTEMBER 27, 2017

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, Hon. John Barrasso (chairman of the committee) presiding.

Present: Senators Barrasso, Carper, Inhofe, Boozman, Fischer, Rounds, Ernst, Merkley, Gillibrand, Booker, Markey, and Harris.

OPENING STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR FROM THE STATE OF WYOMING

Senator BARRASSO. Good morning. I call this hearing to order.

So far, in 2017, as all of our guests of the panel know, in 2017 fires have burned more than 8 million acres in the United States. We need to find solutions to address this threat to our communities and to wildlife.

Today the Committee is going to hear testimony on three bills related to catastrophic wildfires burning across the West. Senator Daines has introduced Senate 605, the Litigation Relief for Forest Management Projects Act, which would address conflicting circuit court decisions and prevent costly delays in forest management as a result of duplicative consultation requirements.

The Committee will hear testimony on Senator Hatch's bill, S. 1417, the Sage Grouse and Mule Deer Habitat Conservation and Restoration Act of 2017. S. 1417 would allow for removal of pinyon and juniper trees, which are invasive species that lead to wildfires and compromise habitat for mule deer and sage grouse across the West.

We also have Senator Thune's bill, S. 1731, the Forest Management Improvement Act of 2017, which provides the Forest Service with a series of tools to address the ever-growing wildfire threats of forests filled with dead and dying trees.

Each of these bills addresses a different, but important part of forest health and fire prevention.

Decades of fire suppression and a rapid decline in active management have led to overly dense forests susceptible to disease and to pest outbreaks. Pests or disease leave thick stands of dead trees, which are poor habitat for iconic species such as elk, lynx, deer, and other wildlife that depend on vibrant forest ecosystems. The dead trees affect watersheds, as well, as there are no longer leaves or needles to hold snow to build winter snowpack.

In addition, these dead forests are much more prone to catastrophic fires. These hot, fast-moving fires are unpredictable and cause significant damage to the ecosystem and surrounding communities. There are the obvious impacts from these fires, and we have a poster board to show Bambi running away from a wildfire. Wildlife that flee too slowly are burned, homes and habitat are lost, and smoke billows into the air.

Smoke and ash travel for miles, spreading fear among those who already face respiratory challenges, as this poster shows. Looks like a woman and her child walking with masks over their faces because of the impact of the smoke from the fire. It is not uncommon to see people, including children and the elderly, wearing face masks. Coughing, sneezing, and watery eyes leads people to ask, is all that wildfire smoke damaging my health?

On September 11th, a National Public Radio article highlighted these concerns, and I will submit a copy of the article for the record.

[The referenced information follows:]

NPR NOW
WAMU 88.5

shots

YOUR HEALTH

Is All That Wildfire Smoke Damaging My Lungs?

Listen · 3:07 Queue Download Transcript

September 11, 2017 · 4:53 AM ET
Heard on Morning Edition

JANE GREENHALGH

Residents of the community of Tujunga, Calif., flee a fire near Burbank on Sept. 2. Even people much farther from the flames are feeling health effects from acrid smoke.

David McNew/Getty Images

It's an unusually bad wild fire season in the West, and for weeks people across the region have been breathing air thick with smoke.

"There's smoke from Canada, smoke from Idaho, smoke from California and Montana. There's smoke everywhere," says Greg Svelund, a spokesman for Oregon's Department of Environmental Quality.

A quick look at the Environmental Protection Agency's Air Now website shows unhealthy or hazardous air conditions all over the Pacific Northwest and into Northern California, Idaho and Montana.

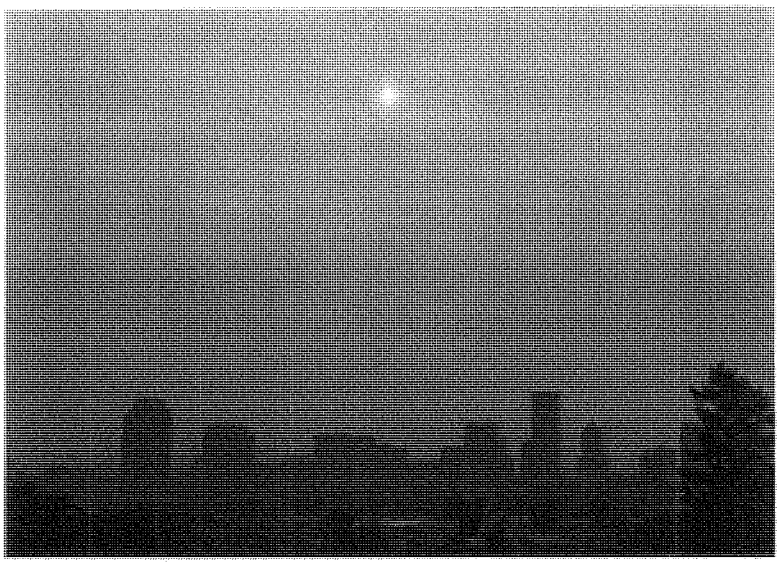
"My lungs have been really sore. It's hard to breathe and it smells like we're in a campfire," says Tucker McClaran, who I found riding her bike in Portland, Ore. She's wearing what looks like a biker's face mask. "It's hot," she says. "It's chemically and it's gross."

SHOTS - HEALTH NEWS

Wildfire Smoke Becomes The Health Threat That Won't Go Away

Will her face mask really help protect her lungs? And what are the long-term health risks of breathing this acrid, yellow air?

To answer those and other health questions, I met up with Dr. Gopal Allada, a pulmonologist and critical care specialist at Oregon Health & Science University.



The sun was barely visible over downtown Portland on Wednesday because of wildfires burning east of the city in the Columbia River Gorge.

Don Ryan/AP

We're on a balcony at the university hospital, overlooking the smoky city.

"This haze represents a lot of ambient smoke particles and particulate that's burning from the trees and organic matter," Allada says. "It's hanging in the air and hitting our lungs, hitting our nose and causing problems."

The falling flecks of ash get lodged in our eyes and nose and cause irritating symptoms like itchy eyes, sore throat, headaches — even a little nausea. But it's the fine particles — particulate matter that's 2.5 microns or less in diameter — that are the biggest health hazard. They're so small you can't see them.

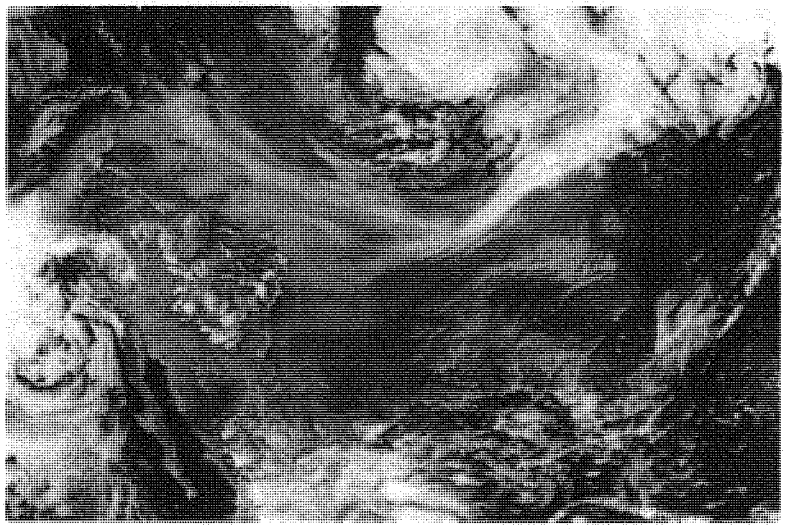
"This is not good for our lungs," Allada says. "When you inhale these really small particles, smaller than a few microns, they can land in your lungs and cause respiratory symptoms." They can even pass into your bloodstream.

For most people, the risk of any serious complications, like chest pain, irregular heartbeat or even heart attack, is minimal. But for people who have underlying heart conditions or respiratory illnesses — such as asthma or chronic lung disease — exposure to wildfire smoke can be serious. Other high-risk groups include people over 65, children (whose lungs are still developing) and pregnant women, because of the risk to the fetus.

The best way for everyone to minimize the risk when skies are smoky is to stay inside.

"Close all windows and doors unless it's really hot," Allada says. "And use the recirculate button in your car or on your air conditioner, so you are not bringing in new particulate matter."

If you don't have air conditioning, try spending some time in a library, mall, or community center that does, says Dr. Ann Thomas, a preventive medicine specialist with the Oregon Health Authority, which has published a pamphlet on the health effects of wildfire smoke.



A smoky pall hangs over much of the western United States in early September.
Earth Observatory/NASA

A standard dust mask that you can buy at the pharmacy won't do you much good, Thomas says. It may keep out the large pieces of ash, but it also may cause you to inhale more deeply, and it won't filter out the microscopic particles that can get into your lungs. An N95 mask can filter out 95 percent of smoke particles, but only if it's fitted properly and dirty air doesn't leak around the sides.

In addition to the particulates, there are gases like carbon monoxide and cyanide in wildfire smoke, but these are more of a danger to firefighters who work close to the flames and are exposed year after year, says Thomas.

The rest of us shouldn't worry too much about long-term damage, even if the smoke persists for a few days or weeks. "I don't want to downplay the significance of the symptoms that many of us are feeling," Thomas says. "But the good news is, they go away. They'll resolve quickly, unless you are in one of these high-risk groups."

If you are at high risk, you might want to invest in a high-efficiency particle arresting (HEPA) air filter, which costs around $50 to $300. And when air conditions are bad, avoid

burning candles, frying meat, even vacuuming, which can all add more tiny particles to the air. And drink lots of water. The fluid keeps your eyes, nose and throat moist, which can help alleviate irritation.

wildfire smoke lungs breathing wildfires

Here's To Your Health

We're reporting in on the latest in medical research, insurance coverage, plus managing your health and the health of the people you love. Coming to your inbox once a week!

What's your email?

SUBSCRIBE

By subscribing, you agree to NPR's terms of use and privacy policy.

Senator BARRASSO. In 2017 alone, schools in Oregon, Montana, and even Florida have canceled classes to keep children inside and away from the smoke.

While smoke and falling ash disburse relatively quickly, other impacts remain for years to come. After a catastrophic fire is extinguished by brave wildland firefighters or by early snows, forest ecosystems lose their topsoil. Hot fires sterilize the soil and, without a strong root system to hold that soil back, these landscapes experience massive erosion. Dirt, sand, and other silt quickly accumulates in creeks and streams, devastating aquatic life and clogging municipal water systems. High sediment levels raise water temperature and can be also a cause of widespread fish kills.

What is most egregious is that our Federal land managers could mitigate a significant portion of these risks. Fire is a historically important part of an ecosystem, but these large, unnatural, catastrophic wildfires are not. In order to address this threat, we need to actively manage forests with excess dead wood. Large stands of dead trees need to be removed in a timely fashion so we are not facing another 8 million acres of burned lands.

We must act quickly to address the risk to human health, infrastructure, and valuable ecosystems. There are millions of acres of Federal land, forestland in dire need of thinning, restoration, and other attention. Last year, the Forest Service estimated that up to 100 million acres are at some risk of wildfire.

Today we will hear about bills that address bureaucratic processes that prevent or delay proactive fire prevention and ecosystem management; bills that can save lives, property, and protect our forests' diverse wildlife.

So, before we move to the sponsors and cosponsors of the bills for their remarks, I would turn to Ranking Member Carper for his remarks.

OPENING STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. Thanks, Mr. Chairman. Thank you for pulling this all together.

Welcome to our colleagues.

I am delighted to be holding this hearing; it is an important one for all of us, whether we are from the great northwest or a little State on the east coast. Our Country has experienced, as we know, a number of significant natural disasters this year, increasingly destructive hurricanes, catastrophic wildfires, and these disasters disrupt and endanger people's lives, their homes, their health, their safety, and their livelihoods. Wildfires and hurricanes, for that matter, also destroy habitat and imperil our wildlife.

I agree with the Government Accountability Office that climate change contributes to making these disasters more severe. They are becoming more common, more destructive, and exponentially more expensive with each passing year.

As we know, at the start of every Congress GAO publishes something called their High-Risk List. They do so to call attention to areas within the Federal Government that pose a high risk due to their vulnerabilities, and also lead to spending a lot of money. Once again, in 2017, GAO noted that climate change presents a signifi-

cant financial risk to the Federal Government, and we are seeing that across this Country, from the fires out West to the devastation in Puerto Rico and the U.S. Virgin Islands in the last week.

As our Federal budget deficit for this year climbs passed $700 billion and headed higher, among other things, we need to ensure we help reduce the risk of future disasters and plan for response costs.

When it comes to planning for severe weather events, an ounce of prevention is worth a pound of cure.

Today I look forward to hearing, we look forward to hearing from our colleagues, and then our witnesses, how best to manage this serious threat posed by wildfires. We need to make sure we that we are taking appropriate steps to prevent wildfires from occurring. We must also ensure that our first responders, our Federal agencies, and local governments have the tools that they need to combat faster, longer, and more frequent wildfires.

I agree with my colleagues that environmental laws should be nimble, not unduly impede our preparation for and our response to these unprecedented wildfires. However, I do not believe that environmental laws are to blame for their occurrence. Many factors contribute to the severity of wildfires. They include homes and other developments located near forestlands, along with climate change, as I have mentioned, and other factors as well.

As I have said before, we need to be very careful about making sweeping changes to the National Environmental Policy Act and the Endangered Species Act, particularly when existing authorities, more targeted changes, and adequate funding can help to address our challenges.

We must also adopt budgets that provide for proactive forest management and firefighting activities. Budget constraints may actually be preventing the Forest Service from using existing authorities to more efficiently respond to fires and mitigate their risks, and the problem is getting worse.

In 1995, only 16 percent of the U.S. Forest Service budget was dedicated to fire suppression. Sixteen percent in 1995. Since 2015, the Forest Service has been spending more than half of its annual budget, over half of its annual budget fighting fires. According to Secretary Perdue, firefighting activities will likely consume two-thirds of the Forest Service budget by 2021.

I hope today's hearing will lead to even more thoughtful discussions and to a growing bipartisan consensus in the Congress in the days ahead on how to build greater resilience that will enable us to cost-effectively address the increase in enormously expensive natural disasters that we have been witnessing in our Country in recent years.

In closing, I ask unanimous consent to enter, Mr. Chairman, several letters and documents from concerned stakeholders into the record.

And, again, we thank all of our colleagues for joining us today.

Senator BARRASSO. Without objection, they will be ordered.

Thank you very much, Senator Carper.

[The referenced information follows:]

September 26, 2017

Honorable John Barrasso
Chairman
Environmental and Public Works Committee
United States Senate
410 Dirksen Senate Office Building
Washington, D.C. 20510

Thomas R. Carper
Ranking Member
Environmental and Public Works Committee
United States Senate
456 Dirksen Senate Office Building
Washington, D.C. 20510

Re: Sage-Grouse and Mule Deer Habitat Conservation and Restoration Act of 2017

Dear Chairman Barrasso and Ranking Member Carper:

We are writing to express our concerns with the "Sage-Grouse and Mule Deer Habitat Conservation and Restoration Act of 2017" (S.1417) and its companion in the House of Representatives (H.R. 3543). This legislation is unnecessary, as sensible, transparent, science-based planning does not delay timely treatment of sagebrush habitats. In addition, the contemplated categorical exclusion for environmental review would not only eliminate public review and input on public lands management, but could also cause irreparable harm to the species and ecosystem it is intended to benefit.

This legislation unadvisedly endorses certain management prescriptions for treating vegetative conditions that are scientifically unproven and could, in fact, contribute to the continued degradation of wildlife habitat, putting sage-grouse, mule deer and other species at risk. Sagebrush grasslands are a fragile and slow- growing ecosystem. Unproven or intensive management practices, including grazing, chaining, yarding, and broadcast burning or spraying can cause irreparable damage to vegetation, soils and watersheds that otherwise require decades to recover from disturbance. Unfortunately, this bill promotes such heavy- handed techniques by directing the rollback of comprehensive, tiered management planning that considers the best available scientific information essential for developing preferred alternatives for managing this delicate and complex landscape.

This legislation unnecessarily subverts the National Environmental Policy Act (NEPA). Encroachment from native trees and incursion by invasive species in sagebrush steppe occurs over decades and results from a variety of factors. Federal agencies and partners have treated habitats and removed pinyon-juniper from tens of thousands of acres of sagebrush grasslands on public and private lands in recent years under current planning requirements. There is no need for expedited planning for vegetation management on sagebrush grasslands. Moreover, assessing the potential impacts of projects under NEPA has become increasingly important as science and management prescriptions continue to evolve.

In addition, federal agencies, not Congress, are responsible for proposing, establishing, and implementing categorical exclusions based on their experience with categories of actions they determine do not individually or cumulatively have significant impacts. Categorical exclusions are typically reserved for routine activities and, when properly developed and applied, they are an appropriate and efficient form of NEPA review. However, with the activities outlined for exclusion in this bill, managing agencies have traditionally produced environmental assessments, if not full environmental impact statements, an indication that these vegetation management projects can have significant impacts on the environment and that there may be a good reason the agencies have declined to create a new categorical exclusion for them.

When directed through legislation, decisions on how CE's are to be used on public lands and resources risk evading public scrutiny and avoiding meaningful public input. This is why the White House Council on Environmental Quality issued guidance on the topic and explicitly warned that "[a]n inappropriate reliance on categorical exclusions may thwart the purposes of NEPA, compromising the quality and transparency of agency decision-making as well as the opportunity for meaningful public participation and review."[1]

Finally, the project-level environmental analysis S.1417 aims to eliminate is essential for tailoring management prescriptions to support preferred site conditions; identify sensitive resources (including historic, remnant and naturally re-colonizing pinyon-juniper stands/trees) that should be spared in control efforts; and illuminate not just the symptoms and prescriptions for unnatural conditions, but also the *causes* for the spread native trees and invasive species, which can be key to future, preventative management.

With the potential damaging consequences of the proposed categorical exclusion and the lack of urgency for such a waiver on the ground, we recommend that the Committee on the Environment and Public Works reject S.1417.

Sincerely,

American Bird Conservancy
Center for Biological Diversity
Defenders of Wildlife
Earthjustice
Environmental Protection Information Center
Grand Canyon Trust
GreenLatinos
Hip Hop Caucus
Klamath Forest Alliance
League of United Latin American Citizens
Natural Resources Defense Council
San Juan Citizens Alliance
Vet Voice Foundation
Western Watersheds Project

cc: Members, Committee on Environment and Public Works

---

[1] White House Council on Environmental Quality, Final Guidance on "Establishing and Applying Categorical Exclusions Under the National Environmental Policy Act," available at: https://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-CatEx_guidance.pdf

September 25, 2017

The Honorable John Barrasso
Chairman
Committee on Environment and Public Works
United States Senate
410 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Tom Carper
Ranking Member
Committee on Environment and Public Works
United States Senate
456 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Barrasso and Ranking Member Carper,

On behalf of the Center for Biological Diversity and our 1.5 million members and activists, I would like to submit written testimony on S. 605, the Litigation Relief for Forest Management Projects Act, which we strongly oppose.

The U.S. Fish and Wildlife Service is expected to complete a programmatic consultation on the effects of forest projects on the threatened Canada lynx and its critical habitat in October of 2017 — within a month from the date of the legislative hearing on S. 605. The Fish and Wildlife Service only received a request from the U.S. Forest Service on this consultation on July 1, 2017.[1] In other words, the Fish and Wildlife Service is expected to complete this consultation in about 100 days, slightly longer than the 90 day requirement of the Endangered Species Act ("ESA").

Critical habitat was designated for the Canada lynx in 2009.[2] Had the Forest Service complied with the ESA's consultation regulations in 2009, which have been in place since the Reagan administration, this entire fake and manufactured crises could have been avoided. Instead of conducting a consultation, which could have been completed in a matter of months, the Forest Service chose instead to embark on a lengthy and futile legal crusade for nearly five years. Crying that the sky would fall if the Forest Service were forced to complete these programmatic consultations, the Forest Service deceived the public and Congress as to how onerous these consultations would be. There is simply no way that if the Service has simply abided by the District Court decision in 2013, rather than pursue three legal appeals, the consultations would

[1] *See*, Biological Assessment for Canada Lynx Designated Critical Habitat, available at: https://www.biologicaldiversity.org/species/mammals/Canada_lynx/pdfs/US_Forest_Service_Biological_Assessment_of_Canada_Lynx.pdf

[2] *Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx*, 74 Fed. Reg. 8616 (Feb. 25, 2009).

Alaska · Arizona · California · Florida · Minnesota · Nevada · New Mexico · New York · Oregon · Vermont · Washington, DC
P.O. Box 710 · Tucson, AZ 85702-0710 tel: (520) 623.5252 fax: (520) 623.9797 www.BiologicalDiversity.org

have been complete, forest management projects would have been approved, and Canada lynx habitat would have been properly managed and mitigated for if damage to it was anticipated.

Programmatic consultations targeted by S. 605 are not onerous. For example, in June of this year, the Fish and Wildlife Service completed a *Cottonwood*-type consultation covering nine national forests in the Sierra Nevada region following the designation of critical habitat for the Yosemite toad, Sierra Nevada yellow-legged frog, and the mountain yellow-legged frog. This consultation was completed in 10 days from the receipt of the request by the Forest Service to conduct this consultation.[3]

Likewise, the consultations on critical habitat revisions targeted by S. 605 are not common. Thus they do not have the catastrophe-inducing impacts on the Forest Service's operations claimed by the proponents of this legislation. The revision of critical habitat is a relatively rare event. In most cases, critical habitat is designated at the same time that a species is listed, and is unlikely to be modified in the future. For species like the Canada lynx and Sierra Nevada frogs, the main reason that critical habitat is revised or designated after listing is due to political interference. Critical habitat was repeated targeted by the Republican majority through the appropriations process. While Canada lynx critical habitat required revision in 2009 because the original designation in 2006 during the Bush administration was scientifically and legally deficient.

The far more damaging consequence of S. 605 is the prohibition on programmatic consultations when threatened and endangered species are added to the list of species protected by the ESA. While the *Cottonwood* decision only applied to the revision of critical habitat, this legislation would also limit consultations when species are added to the ESA list. The long-standing regulations covering reinitiation of consultations also envision agencies like the Forest Service consulting on their actions when species are added to the endangered species lists because often it is those very activities that have *caused* a species to become endangered in the first instance. While the Forest Service has consistently, and blindly, supported S. 605, it has never articulated a coherent rationale as to why or how consultations covering additional species being protected by the ESA is impractical, unnecessary or onerous.

Programmatic consultations when species are added to the ESA lists are important because they are the only time when the land management agencies and the U.S. Fish and Wildlife Service take the time to consider the needs for a species as a whole, and to avoid death-by-a-thousand-cuts scenarios. It is unrealistic to assume that the Forest Service would take a larger view of what an endangered species needs holistically just during a site-specific consultation. S. 605 would make it harder to conserve and recover listed species, ultimately making recovery more expensive because management would be fractured and inconsistent project to project.

---

[3] *See*, Amendment of the Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad, available at: https://www.biologicaldiversity.org/campaigns/amphibian_conservation/pdfs/Sierra_Nevada_Forests_Endangered_Frogs_Biological_Opinion.pdf

CENTER for BIOLOGICAL DIVERSITY Because life is good.

Finally, it is worth noting that the Forest Service is generally behind on revising land management plans. According to the schedule put forward by the Forest Service, most land management plan revisions are at least 3-5 years behind schedule. If S. 605 were to become law, programmatic reviews of endangered species would happen only once every 20 years. This would significantly undermine conservation across the Forest Service system, potentially putting individual species on a fast-track to extinction.

S. 605 is an overbroad solution to a problem that was manufactured by the Forest Service to accomplish a cynical goal of simply turning a blind-eye to the needs of endangered species. The Forest Service can solve this crisis by complying with the law, something that all other agencies of the federal government have had little difficulty doing for decades.

Thank you for the opportunity to submit comments on this important topic.

Sincerely,

Brett Hartl
Government Policy Director
Center for Biological Diversity
Washington, D.C. 20008

Alaska · Arizona · California · Florida · Minnesota · Nevada · New Mexico · New York · Oregon · Vermont · Washington, DC
P.O. Box 710 · Tucson, AZ 85702-0710 tel: (520) 623.5252 fax: (520) 623.9797 www.BiologicalDiversity.org

"SUBJECT TO CHANGE"

Schedule of Forest Service Land Management Plan Revisions & New Plans

October 1, 2016

The following five tables display the updated Service-wide Land Management Plan (LMP) Revision Schedule for each unit of NFS by fiscal year as well as the schedule for the development of new plans for recently established units of NFS. Table 1 lists plan revisions completed to date. Table 2 lists plan revisions under the 1982 planning rule procedures. Table 3 lists plan revisions under the 2012 planning rule. Table 4 lists plans that have not been revised and their required revision dates under NFMA. (Note: The units in Table 4 are not presently in revision). Table 5 displays the schedule for development of new plans for recently established units of NFS.

Posting of this schedule does not constitute an initiation of a plan development or revision process for any NFS unit. Public notice that the assessment for plan revision is beginning,, which is published in the Federal Register as well as in newspapers of general circulation within the area covered by the plan, initiates the revision process for each plan. Additionally, the posting of this schedule on the Forest Service Ecosystem Management Coordination staff website does not, in itself, constitute an action subject to the National Environmental Policy Act (NEPA) procedures of 40 CFR parts 1500 – 1508 or Forest Service NEPA procedures, 36 CFR 220, or Forest Service Handbook 1909.15. The Service-wide LMP Revision Schedule will continue to be adjusted as necessary and, at regular intervals, posted on the Forest Service Ecosystem Management Coordination staff website at *http://www.fs.fed.us/emc/nfma/index.htm*

.

Each listed plan revision unit is also a hyperlink to the planning webpage of that unit. For each ongoing plan revision effort, the unit supervisor lists the project contact, phone number and e-mail within the national forest's schedule of proposed actions found at http://www.fs.fed.us/sopa/.

TABLE 1 – LMP REVISIONS COMPLETED BY FISCAL YEAR

Region	State	Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	Revision Completion Date 1/ Fiscal Year
8	SC	Francis Marion NF 3/	1996
8	TX	NFs in Texas	1996
2	CO	Rio Grande NF 3/	1997
2	SD	Black Hills NF	1997
4	ID	Targhee NF	1997
8	PR	Caribbean NF (El Yunque NF) 3/	1997
2	CO	Arapaho-Roosevelt NF	1998
2	CO	Routt NF	1998
8	FL	NFs in Florida	1999
8	LA	Kisatchie NF	1999
1	ND	Dakota Prairie NG	2002
2	CO	White River NF	2002
2	NE	Nebraska NF	2002
2	WY	Thunder Basin NG	2002
8	NC	Croatan NF	2002
10	AK	Chugach NF 3/	2002
4	ID	Curlew NG	2002
4	ID	Caribou NF	2003
4	UT	Wasatch-Cache NF	2003
4	UT	Uinta NF	2003
4	ID	Boise NF	2003
4	ID	Payette NF	2003
4	ID	Sawtooth NF	2003
2	WY	Medicine Bow NF	2004
8	AL	NFs in Alabama	2004
8	GA	Chattahoochee-Oconee NF	2004
8	TN	Cherokee NF	2004
8	VA	Jefferson NF	2004
8	SC	Sumter NF	2004
8	KY	Daniel Boone NF	2004
9	WI	Chequamegon-Nicolet NF	2004
9	MN	Chippewa NF	2004
9	MN	Superior NF	2004

1/ Completion Date = Final decision document signed
2/ Original ROD issued in 9/2005 but was reissued in 4/2006 due to omission of information
3/ Second round of LMP revision, refer to Table 2 or Table 3

TABLE 1 – LMP REVISIONS COMPLETED BY FISCAL YEAR -- Continued

Region	State	Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	Revision Completion Date 1/ Fiscal Year
2	WY	Bighorn NF	2005
8	AR	Ouachita NF	2005
8	AR	Ozark-St. Francis NF	2005
9	NH	White Mountain NF	2005
9	MO	Mark Twain NF	2005
5	CA	Angeles NF 2/	2006
5	CA	Cleveland NF 2/	2006
5	CA	Los Padres NF 2/	2006
5	CA	San Bernardino NF 2/	2006
9	OH	Wayne NF	2006
9	IN	Hoosier NF	2006
9	IL	Shawnee NF	2006
9	VT	Green Mountain NF	2006
9	NY	Finger Lakes NF	2006
9	MI	Hiawatha NF	2006
9	MI	Huron-Manistee NF	2006
9	MI	Ottawa NF	2006
9	WV	Monongahela NF	2006
9	PA	Allegheny NF	2007
10	AK	Tongass NF	2008
1	MT	Beaverhead-Deerlodge NF	2009
8	NC	Uwharrie NF	2012
3	NM	Cibola NG	2012
5	CA	Sequoia NM	2012
2	CO	San Juan NF	2013
3	AZ	Kaibab NF	2014
8	VA	George Washington NF 3/	2014
8	MS	NFs in Mississippi	2014
1	ID	Idaho Panhandle NF	2015
1	MT	Kootenai NF	2015
2	WY	Shoshone NF	2015
3	AZ	Prescott NF	2015
3	AZ	Apache-Sitgreaves NF	2015

1/ Completion Date = Final decision document signed
2/ Original ROD issued in 9/2005 but was reissued in 4/2006 due to omission of information
3/ Second round of LMP revision, refer to Table 2 or Table 3

TABLE 2 - LMP Revisions under the 1982 Planning Rule Procedures 5/ by Fiscal Year

Region	State	Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	NFMA Required Revision Date Fiscal Year	Actual Revision Initiation Date 1/ Fiscal Year	Updated NOI Date 2/ Fiscal Year	Expected Revision Completion Date 3/ Fiscal Year
5	CA	LTBMU	2003	2006	2010	2016
3	AZ	Coronado NF	2001	2005	2010	2017
3	AZ	Coconino NF	2002	2006	2010	2017
6	OR	Malheur NF	2005	2004	2010	2017
6	OR	Umatilla NF	2005	2004	2010	2017
6	OR	Wallowa-Whitman NF	2005	2004	2010	2017
6	WA	Colville NF	2003	2003	2011	2017

1/ Initiation = Notice of Intent (NOI) published
2/ Updated NOI taking into account of new information
3/ Completion = Final decision document signed
4/ Second round of LMP revision
5/ Under the 2012 Planning Rule (Title 36, Code of Federal Regulations, Part 219–Planning) the responsible official may complete and approve the plan revision in conformance with the provisions of the prior planning regulation, including the transition provisions of the reinstated 2000 rule (36 CFR part 299, published at 36 CFR parts 200 to 299, revised as of July 1, 2010). The transition provisions allow the use of the 1982 planning procedures (See CFR parts 200 to 299, Revised as of July 1, 2000).

TABLE 3 - LMP Revisions under the 2012 Planning Rule by Fiscal Year

Region	State	Planning Unit Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	NFMA Required Revision Date Fiscal Year	Notice to Begin Assessment Date 4/ Fiscal Year	Expected NOI Date 1/ Fiscal Year	Expected DEIS Date 2/ Fiscal Year	Expected ROD Date 3/ Fiscal Year
8	SC	Francis Marion NF	2011	2013	2014	2015	2017
5	CA	Inyo NF	2003	2013	2014	2016	2017
5	CA	Sequoia NF	2003	2013	2014	2016	2017
5	CA	Sierra NF	2007	2013	2014	2016	2017
8	PR	El Yunque NF	2012	2012	2014	2016	2017
10	AK	Chugach NF	2017	2013	2016	2017	2018
8	NC	Nantahala Pisgah NF	2002	2013	2014	2017	2018
1	ID	Nez Perce - Clearwater NF	2002	2012	2014	2017	2018
1	MT	Flathead NF	2001	2013	2015	2016	2018
3	NM	Cibola NF	2000	2013	2015	2017	2018
2	CO	Rio Grande NF	2012	2016	2016	2017	2018
1	MT	Helena – Lewis & Clark NF	2001	2014	2016	2017	2018
3	NM	Carson NF	2001	2014	2016	2017	2018
3	NM	Santa Fe NF	2002	2014	2016	2017	2018
3	AZ	Tonto NF	2000	2014	2017	2018	2019
3	NM	Gila NF	2001	2016	2017	2018	2019
3	NM	Lincoln NF	2001	2016	2017	2018	2019
1	MT/SD	Custer Gallatin NF	2002	2016	2017	2018	2019

1/ Initiation = Notice of Intent (NOI) published
2/ Draft Environmental Impact Statement published
3/ Completion= Final decision document signed
4/ Intent of this field is to capture when work began on the Assessment phase; a formal notice may or may not have been published

TABLE 4 – LMPS NEEDING REVISION BY FISCAL YEAR

Region	State	Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	NFMA Required Revision Date Fiscal Year	Scheduled Revision Initiation Date 1/ Fiscal Year	Scheduled Revision Completion Date 2/ Fiscal Year
1	MT	Custer NF	2002		
1	MT	Gallatin NF	2002		
1	MT	Bitterroot NF	2002		
1	MT	Lolo NF	2001		
2	CO	Pike San Isabel NF	1999		
2	CO	GMUG NF	1998		
4	ID	Salmon-Challis NF	2002		
4	UT	Dixie NF	2001		
4	UT	Fishlake NF	2001		
4	UT	Manti-LaSal NF	2001		
4	UT	Ashley NF	2001		
4	NV	Humboldt-Toiyabe NF	2001		
4	WY	Bridger-Teton NF	2005		
5	CA	Plumas NF	2003		
5	CA	Tahoe NF	2005		
5	CA	Lassen NF	2008		
5	CA	Eldorado NF	2004		
5	CA	Stanislaus NF	2006		
5	CA	Klamath NF	2010		
5	CA	Six Rivers NF	2010		
5	CA	Mendocino NF	2010		
5	CA	Shasta-Trinity NF	2010		
5	CA	Modoc NF	2006		
6	OR	Rogue River NF	2005		
6	OR	Siskiyou NF	2004		
6	OR	Umpqua NF	2005		
6	OR	Mt. Hood NF	2005		
6	OR	Siuslaw NF	2005		
6	OR	Willamette NF	2005		
6	WA	Gifford Pinchot NF	2005		
6	WA	Mt. Baker-Snoqualmie NF	2005		
6	WA	Olympic NF	2005		
6	OR	Deschutes NF	2005		
6	OR	Ochoco NF	2004		
6	OR	Crooked River NG	2004		
6	OR	Fremont/Winema NFs	2004/05		

1/ Initiation = Notice of Intent (NOI) published
2/ Completion = Final decision document signed

TABLE 5 – DEVELOPMENT OF NEW LMPS BY FISCAL YEAR

Region	State	Planning Unit NF = National Forest NG = National Grassland NRA = National Recreation Area	Scheduled Initiation Date 1/ Fiscal Year	Actual or Scheduled Completion Date 2/ Fiscal Year
8	KY	Land Between the Lakes NRA	2003	2005
9	IL	Midewin National Tallgrass Prairie	1998	2002

1/ Initiation = Notice of Intent (NOI) published
2/ Completion = Final decision document signed

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
FF08ESMF00-
2014-F-0557-1

JUN 15 2017

Mr. Randy Moore
Regional Forester
Pacific Southwest Region
U.S. Forest Service
1323 Club Drive
Vallejo, California 94592

Subject: Amendment of the Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad

Dear Mr. Moore:

This is in response to your June 5, 2017, request for reinitiation of section 7 consultation on the programmatic consultation with the U.S. Fish and Wildlife Service (Service) on nine forest programs for nine National Forests in the Sierra Nevada of California for the endangered Sierra Nevada yellow-legged frog (*Rana sierrae*), endangered Northern Distinct Population Segment of the mountain yellow-legged frog (*Rana mucosa*), and threatened Yosemite toad (*Anaxyrus canorus*) (collectively hereinafter "three listed amphibians" or "three listed species"). Critical habitat for the three listed amphibians was not designated at the time of issuance of the original December 19, 2014, Programmatic Biological Opinion. Critical habitat was designated on August 26, 2016, and you have requested reinitiation of the Programmatic Biological Opinion to analyze effects of the proposed action on critical habitat for these three species. This biological opinion is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act).

Many of the published peer-reviewed papers and unpublished reports on the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog were issued prior to the analysis and taxonomic reclassification by Vredenburg *et al.* (2007). These two species have undergone elevation to subspecies and other changes in their systematics and taxonomy; but because they possess similar morphologies, behaviors, biologies, and ecologies, within this programmatic biological opinion when the information applies to both animals, they will be collectively referred to as "mountain yellow-legged frog".

This programmatic biological opinion is based on: (1) letter from the Forest Service to the Service dated June 16, 2014, requesting initiation of formal consultation for the nine Forest programs; (2) *Biological Assessment for Actions that Affect the Sierra Nevada yellow-legged frog, N. DPS. Mountain yellow-legged frog, and Yosemite toad on National Forest Lands in the Sierra Nevada* (2014 BA), dated June 13, 2014, that was prepared by the Forest Service; (5) *draft Status of the Mountain Yellow-legged Frog, Yosemite Toad and Pacific Chorus Frog in the Sierra Nevada, CA* dated April 2011 prepared by the U.S. Forest Service

(USFS); (6) *Habitat Definitions for the USFS Programmatic BA* (Habitat Definitions) undated, but received from the Forest Service on June 3, 2014; (7) The *USDA Forest Service, Pacific Southwest Region Biological Assessment for Actions that Affect Designated Critical Habitat of Sierra Nevada Yellow-Legged Frog, N. DPS Mountain Yellow-Legged Frog, and Yosemite Toad on National Forest Lands in the Sierra Nevada* (2017 BA), dated June 1, 2017, prepared by the U.S. Forest Service; and (8) other information available to the Service.

The conservation measures in this biological opinion are the Standard and Guides (S&Gs) in the 2004 Sierra Nevada Forest Plan Amendment Record of Decision (Appendix A) and the Region 5 Best Management Practices (BMPs) (Appendix B). It is understood that minor project specific adjustments to the conservation measures may be needed for site specific conditions, and that these projects may be appended to this programmatic biological opinion. In these cases, the biological rationale for changes must be clearly articulated as part of the project description included in the biological opinion appendage.

During emergency activities such as wildfire suppression, the Forest Service should initiate emergency consultation in accordance with the section 7 implementation regulations as outlined in 50 CFR § 402. The Service considers the protection of firefighters and other personnel to be of paramount importance.

Consultation History

A comprehensive list of the dates, participants, and topics discussed are included in the BA. The relevant events that have occurred since June 16, 2014 are as follows:

June 13, 2014	The Forest Service, Service, California Farm Bureau, California Cattlemen's Association, California Woolgrower's Association, and the University of California at Davis, met about issues regarding livestock grazing and the programmatic consultation. It was agreed that the project should include a scientific and statistically valid monitoring program focused on the effects of livestock grazing on the Yosemite toad, Sierra Nevada yellow-legged frog, and the Northern Distinct Population Segment of the mountain yellow-legged legged frog.
August 20, 2014	The Service sent the draft programmatic biological opinion to the Forest Service.
September 2014	The Service received comments on the draft programmatic biological opinion from the Forest Service and met with the Forest Service to address these comments.
December 19, 2014	The Service issued the final programmatic biological opinion to the Forest Service.
April 26, 2017	The Forest Service notified the Service that reporting forms and instructions for both take and compliance monitoring have been finalized and provided to the nine National Forests.
June 5, 2017	The Forest Service reinitiated section 7 consultation with the Service to include critical habitat for the three listed species and resolve other issues identified during implementation of the programmatic biological opinion.

Mr. Randy Moore

PROGRAMMATIC BIOLOGICAL OPINION

Description of the Proposed Action

The proposed action is implementation of projects and actions under nine Forest programs in nine National Forests in the Sierra Nevada. The nine National Forests are the Lassen, Plumas, Tahoe, Eldorado, Stanislaus, Sierra, Inyo, and Sequoia National Forests and the Lake Tahoe Basin Management Unit. This project description has been prepared at a programmatic level and includes standard conservation measures appropriate to each program. Individual projects may be appended to this programmatic biological opinion alone or in batches so long as they implement the conservation measures of the proposed action.

The projects submitted for appendage by the Forest Service will be from one of nine Forest programs: 1) timber harvest, vegetation management, fuels management, and watershed restoration; 2) road and trail maintenance; 3) maintenance of developed recreation and administrative infrastructure; 4) special use permits; 5) rangeland management; 6) biological resources management; 7) invasive species management; 8) mining; and 9) lands and real estate. Projects that involve pesticide application do not quality for appending to this programmatic.

The Service will re-evaluate this programmatic consultation at appropriate intervals to ensure that its continued application does not result in unanticipated effects to the three listed amphibians, or suitable habitat. In the event that the Forest Service committed conservation measures are not completely incorporated into the specific design of each project, site-specific characteristics may lead to effects not considered in this programmatic biological opinion, and therefore not appropriate for being appended to this document, the Forest Service must consult separately for the specific project in question.

Procedures for Appending Projects to the Programmatic Biological Opinion

The following information will be provided to the Service by the Forest Service for each project submitted for appendage, and will be used by the Service to evaluate whether the project may be appended to this programmatic biological opinion:

1. The Forest Service will submit a project or list of projects in the nine Forest programs for which appendage to the programmatic biological opinion is requested.

2. The Forest Service will make one of the following effect determinations for the project on the Sierra Nevada yellow-legged frog, and/or the Northern Distinct Population Segment of the mountain yellow-legged frog, and Yosemite toad (and their designated critical habitat if the project occurs in designated critical habitat):

    a. May affect, not likely to adversely affect: The Forest Service will submit project specific biological assessments and any other pertinent information and a letter requesting concurrence with the determination from the Service. . Concurrences with "may affect, not likely to adversely affect" findings may be provided by the Service through individual letters or as part of the "batch" process associated with this programmatic biological opinion (i.e., future appendage letters may include a list of projects that the Service concurs with the Forest Service's "may affect, not likely to adversely affect" findings.

    b. May affect, likely to adversely affect: The Forest Service will submit the appropriate biological and other pertinent information along with a letter requesting that the proposed

project to be appended to this programmatic biological opinion.

3. For each project, the Forest Service will include the following information:

   a. Site-specific analysis of Forest Service actions from potential effects to suitable habitat and known occurrences of the three listed amphibians. The site-specific analyses of each individual project and activity will be included in the BA.

      i. Project name
      ii. Ranger District
      iii. NEPA name
      iv. Decision date
      v. PALS dBase Number
      vi. Project implementation date(s)
      vii. Location
      viii. If survey(s) have been conducted, including dates
      ix. Total project area acres
      x. Which of the three listed amphibian species may be affected and the determination (see item 2, above)
      xi. Clade affected (if known)
      xi. Acres of suitable habitat affected by the project
      xii. Occupied acres affected
         1) acres of utilized habitat
         2) acres of unknown habitat
         3) acres of unutilized habitat
      xiii. Whether the project is located within or may affect designated critical habitat, if so, name(s) of the unit and critical habitat acres affected
         1) primary constituent elements present in the action area
         2) primary constituent elements adversely affected by the proposed action
      xiv. Specific project design criteria, if any, for the three amphibians
      xv. Distance to closest population of the appropriate listed amphibian
      xvi. Forest Service contact person

   b. For each project, the Forest Service will include Geographic Information System (GIS) data, maps, aerial photos, landscape photos, or other information as appropriate and available.

   c. In the case of multiple projects submitted to the Service at one time, the Forest Service will include a summary table for each of the nine National Forests with the following information on each of the three listed amphibians and the nine Forest programs:

      i. Activity (program) type
      ii. Total acres within project areas
      iii. Total project acres in Riparian Conservation Areas
      iv. Total acres of suitable habitat affected
      v. Occupied areas affected
         1) Total acres of utilized habitat affected
         2) Total acres of unknown habitat affected
         3) Total acres of unutilized habitat affected
      vi. Total acres of critical habitat affected
      vii. Primary constituent elements affected

4. The Service will notify the Forest Service via electronic mail whether the information on a project submitted for appendage to this programmatic biological opinion is adequate for analysis, and if not, what additional information is needed. Project level take will be provided in each appendage.

Habitat Definitions for the Three Listed Amphibians

The following definitions were developed by the Forest Service and the Service. "Suitable Habitat," and the sub-categories "Utilized," "Utilization Unknown," and "Unutilized Potential" for the mountain yellow-legged frog and the Yosemite toad are defined in this programmatic biological opinion. Each project will be analyzed for the potential adverse effects on the three listed amphibians, as appropriate, when adversely affecting suitable habitat. For a specific project, the action area may be modified based on local conditions that suggest a low probability of habitat being suitable. In these cases, reasons for this decision will be reviewed and approved by the Service.

1. *Suitable Habitat*

   a. Yosemite toad: Yosemite toad habitat historically spanned elevations from 4,790 to 11,910 feet (Service 2014). Suitable breeding and rearing habitat includes wet portions of meadows, slow-moving streams, shallow ponds, spring systems, and lakes with shallow areas that are inundated at snowmelt and hold water for a minimum of 5 weeks in most years. Some sites containing suitable habitat may not retain water long enough for completion of metamorphosis in drought or below average precipitation years. Suitable habitat that is not used for breeding or development of early life history stages includes all portions of meadows or other occupied breeding habitats and surrounding areas up to a distance of 0.78 mile depending on surrounding landscapes and dispersal barriers. In some cases, additional areas may be important for dispersal.

   b. Mountain yellow-legged frog: Suitable habitat typically occurs above 4,500 feet in elevation, but in some areas, including the west side of the Plumas National Forest, it may be as low as 3,500 feet in elevation. Suitable habitat includes permanent water bodies or those hydrologically connected with permanent water such as wet meadows, lakes, streams, rivers, tarns, perennial creeks, permanent plunge pools within intermittent creeks, and pools, such as a body of impounded water contained above a natural dam. Suitable habitat includes adjacent areas, up to a distance of 82 feet. When water bodies occur within 984 feet of one another, as is typical of some high mountain lake habitat, suitable habitat for dispersal and movement includes the overland areas between lake shorelines. In mesic areas such as lake and meadow systems, the entire contiguous or proximate areas are suitable habitat for dispersal and foraging.

2. *Occupied or Utilized Habitat*: Suitable Habitat consists of one or a combination of "utilized habitat," "utilization unknown habitat," and/or "unutilized potential habitat". Previous surveys conducted by qualified biologists may be used, including surveys conducted by qualified non-Forest Service biologists to determine which habitat category the proposed project falls under. The Forest Service will provide biological data in a project specific biological assessment (see *Procedures for Appending Projects to the Programmatic Biological Opinion*, item 2a) if Service-concurrence is being sought for non-protocol survey(s) results that conclude the action area is not occupied or utilized by one or more of the three listed amphibians. The Service will review these requests and determine if non-protocol survey information is adequate to conclude that the action area is not occupied and notify the Forest Service in writing.

a. *Utilized* (occupied): Suitable habitat that has documented occurrences is used for breeding, development of early stages, resting, foraging, or dispersal. In streams, this includes the length of the stream for a distance of 0.62 mile upstream and 0.62 mile downstream of the location where species has been found.

b. *Utilization Unknown* (occupancy unknown): Suitable habitat where the species has not been observed and the area has not been determined to be unutilized potential based on the definition described below.

c. *Unutilized Potential* (not occupied)

   i. Mountain yellow-legged frog: Suitable habitat where no individuals have been observed during at least three surveys within the previous 10 calendar years. The implementation of the three surveys will be either staggered during one summer with and early, mid, and late season survey (e.g. from 14 calendar days after sufficient habitat becomes free of snow at snowmelt to the fall before cold temperatures trigger movements to overwintering habitats, or conducted during three separate consecutive calendar years, that are ideally but do not have to be consecutive. At least one of the surveys will be conducted during a water year where snowpack is 80 percent or greater than normal for the action area.

   ii. Yosemite Toad: Suitable habitat where no individuals have been detected and the following survey conditions have been met:

      1) At least one protocol survey will be completed each season for three consecutive years during the previous 10 years.
      2) Surveys will be conducted during the period from approximately 21 days to 35 days after breeding pools form at snow melt, and at least one of the surveys will be conducted during a water year where snowpack is 80 percent or greater than normal for the area.

The determination of the type of habitat, and thus, the likelihood that listed amphibians are present is based on existing available survey data collected within the last 10 years or new survey data collected for the project. For example, if the California Department of Fish and Wildlife, U.S. Forest Service, National Park Service, the Service, or the appropriate agency or party has surveyed 2 times within the previous 10 years with no frogs found, then only one additional survey needs to be conducted to determine whether habitat is in the unutilized potential category

Definitions of Forest Service Terms

1. *Best Management Practices* (BMPs): Highly specific mandatory measures used by the Forest Service to meet Department and Agency requirements and policies to ensure non-point source pollutants are controlled, legacy sources of water pollution are remediated, water quality is maintained or improved and the objectives of the Clean Water Act are met. BMPs are prescribed in Forest Plans for each individual National Forest. The current plans have incorporated several amendments, including the 2001 and 2004 Sierra Nevada Forest Plan Amendment.

2. *Standard and Guidelines* (S&Gs): Highly specific mandatory measures to guide design and implementation of management actions used by the Forest Service to meet Department and Agency requirements and policies. S&Gs are prescribed in Forest Plans for each individual

National Forest. The current plans have incorporated several amendments, including the 2001 and 2004 Sierra Nevada Forest Plan Amendment.

3. *Critical Aquatic Refuges* (CARs): Map-delineated subwatersheds of generally 10,000 to 40,000 acres in size (range = 500 to 100,000 acres) in which specific goals and objectives for threatened, endangered and sensitive species as well as riparian-dependent resources are articulated. These designations encompass either known locations of threatened, endangered or sensitive species; vulnerable populations of plant or animal species; or local populations of rare aquatic-or riparian dependent plants or animals. These areas are specified on the project map(s) provided to the Service, and may also be found in Volume 4, Appendix I of the Sierra Nevada Framework Plan Amendment (SNFPA) FEIS (January 2001). S&Gs 91-124 of the SNFPA ROD (USFS 2004) apply to all CARs, RCAs and SMZs.

4. *Aquatic Management Strategy* (AMS): The overarching SNFPA Framework ROD strategy for management of aquatic, riparian, meadow ecosystems and associated species this strategy includes 6 riparian conservation objectives (SNFPA ROD, pages 33-34), a description of desired conditions a set of land allocations (RCAs, CARs, etc.) an adaptive management program and use of landscape analysis process to identify restoration and enhancement projects.

5. *Riparian Conservation Areas* (RCAs): Specifically defined buffers in which management activities are designed to meet specific goals and objectives for streams, special aquatic features, and other hydrological depressions. The width of the buffer varies as follows and may also be adjusted site-specifically to reflect the local topographic and hydrological conditions (S&Gs 91-122 from the SNFPA ROD and apply to all RCAs):

   a. *Perennial Streams*: 300 feet on each side of the stream, as measured from the bank full edge.

   b. *Seasonally Flowing Streams* (Intermittent and Ephemeral): 150 feet on each side of the stream, as measured from the bank full edge.

   c. *Stream Adjacent Slopes Greater Than 70 Percent Gradient*: top of the inner gorge or slope.

   d. *Lakes, Wet Meadows, Bogs, Fens, Wetlands, Vernal Pools and Springs*: 300 feet from the edge of the feature or riparian vegetation, whichever is greater.

6. *Streamside Management Zones* (SMZs) *and Riparian Management Zones* (RMAs): these are broader terms intended to encompass other older naming conventions from streamside buffering areas such as CARs, RCAs, stream protections zones, riparian reserves, riparian habitat conservation areas, etc. All of these designated areas along riparian areas, streams, and wetlands will minimize potential for adverse effects from adjacent management activities (refer to BMPs 1.8 and 1.19). Management activities within these zones are designed to improve riparian values. SMZs are areas other than or in addition to CARs or RCAs that are managed to standards specifically defined in individual Forest Land and Resource Management Plans.

7. *Range of Natural Variability* (RNV): The ecological conditions, plus the spatial and temporal variation in these conditions, that are relatively unaffected by human activities, within a period of time and geographical area appropriate to an expressed goal. A condition described as being "outside the RNV" implies specific pressure(s) on the system, usually anthropogenic in origin, moving it beyond the bounds of historical ecological variability.

8. *Project Manager*: A Forest Service employee with responsibility for designing, implementing, and/or administrating a particular project. This may include, but are not limited to, the following IDT leader, timber sale administrator, permit administrator, etc.

9. *Essential Habitat*: This is a fisheries term used to denote those waters and substrates necessary to fish (or amphibians in this case) for spawning, breeding, feeding, or growth to maturity (Section 1910) of the MSFCMA, 16 USC § 1802(10)). For purposes of interpreting this definition of essential habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by the target species, and may include aquatic areas historically used where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Description of the Nine Forest Programs

The BA contains a list and comprehensive description of nine Forest management activity programs. The nine programs are summarized below:

1. Vegetation Management, Timber Harvest, Fuels Management and Watershed Restoration: This program includes vegetation management conducted for ecological restoration, timber harvest, reforestation, fuels treatment for hazard reduction, fire or fuels treatment, forest health and range land improvement, watershed restoration, wildlife habitat enhancement, road construction, road reconstruction, and road maintenance and log landing construction, including temporary roads, using heavy equipment with either tracks or rubber tires. The most common means of treatment are mechanical, hand including chainsaws, chemical including pesticides (although pesticide use will not be covered in this consultation other than stump application of borax under various trade names such as Sporax), and burning.

   Timber harvest and fuels reduction includes marking, felling, bucking, skidding, yarding, loading by means of mechanical or hand treatments, and hauling designated trees to a mill. Mechanical methods include tracked feller-bunchers or harvesters used to harvest trees followed by skidding material, usually whole tree length, to landing using rubber-tired or tracked skidders. Conventional systems include hand felling and bucking trees followed by skidding material to landing using rubber-tired or tracked skidders. Endlining of felled material will be used when equipment is unable to directly reach felled trees. Water bars for erosion control on skid trails will be installed with either skidders or dozer. Harvest may be followed by reforestation, which includes preparation of the harvested site to treat excess fuels and competing vegetation by means of mechanical or hand piling and single or multiple chemical applications (not covered in this BO), followed by tree planting, and stand maintenance as needed. Other re-vegetation project areas may include trails, roads, prescribed and natural post-fire areas, facilities, and restoration sites. Salvage logging of dead and dying trees within burned acreages may also occur.

   Fuels management activities will be implemented to reduce the size, cost, and damage from wildfire as well as restore fire to the landscape as a natural disturbance process. Fuel biomass will be altered by changing the horizontal and vertical continuity of fuel type, creating fuel breaks, or by reducing or altering fuels over extensive areas by mechanical means as described in vegetation management, by the application of prescribed fire, or managing naturally ignited wildfires. Cull logs and slash may be rearranged, removed, or burned to reduce fuel loading. The silvicultural practices include mechanical, aerial, and/or hand treatments, prescribed fire, reforestation, and chemical application. Prescribed fire includes understory burning, pile

burning, and broadcast burning by means of hand ignition using drip torches, or by aerial application using a helicopter mounted ignition devices such as helitorches for broadcast burning and spherical ignition devices for timber understory burning.

2. Maintenance of Roads and Trails: Road and trail maintenance, including reconstruction, is periodically implemented to ensure safe public use and protect resources. This program includes a number of activities.

   a. Motorized, Reconstruction or Maintenance of roads: For public use, and to administer and protect resources, roads will be periodically reconstructed and maintained. Some roads may be constructed for specific recreation use, and some roads may need to be reconstructed over time to make needed improvements in alignment, grade, width and drainage.

      Road maintenance includes any expenditure for the repair or upkeep of a road necessary to retain the road's approved traffic service level. Work items include surface blading, surface rock replacement, seal coats and asphalt overlays and patching, culvert cleaning, replacement or repair, bridge maintenance or replacement, slide removal, lead out ditching, road side ditch clean out, guardrail installation and replacement, road striping, and other items that contribute to the preservation of the existing road. Regular road maintenance also includes brushing (trimming of trees and shrubs) along the road prism to ensure that visibility for drivers is not hindered. These activities include installing additional minor culverts and traffic control devices, implementing traffic management strategies, placing small quantities of spot surfacing, re-vegetating cut and fill slopes, and blocking and/or disguising unauthorized routes originating on or crossing system routes. Some roads will be allowed to deteriorate gradually over time.

      Where roads and trails are no longer needed or cannot be maintained, the Forest Service may remove them by decommissioning. This involves removal from maintenance schedules and from maps and, in some cases, may involve some on-site activities such as de-compaction of the roadbed, blocking, barricading, installation of water bars, removal of culverts, and re-contouring of slopes.

   b. Maintenance of roads and trails for motorized non-street-legal vehicles: Maintenance of off-highway vehicle (OHV) routes consists of tread maintenance such as loose rock removal, rock and root removal, slough and berm removal, slide maintenance, and grooming of the tread surface; drainage maintenance such as maintenance of water bars, rolling dips, culverts, French drains and other water control/diversion devices; maintenance of water and gully crossings, route maintenance such as removal of fallen logs, brushing along trail prism, removal of hazard trees, litter removal, slope revegetation, snowmobile trail grooming, and closure/restoration of off-route impacts; structure maintenance such as barriers, barricades, retaining walls, trail tread protection measures, cattle guards, fences, and gates; and traffic services such as sign repair and installation. Maintenance work for roads and trails is done by means of mechanical and hand treatments and scheduled on an as needed basis.

      Grooming on specific over-snow vehicle (OSV) trails will be implemented during the winter months to provide recreational opportunities. General maintenance of these routes during the non-snow season consists of actions described under OHV maintenance.

   c. Maintenance of non-motorized trails: The maintenance of non-motorized trails includes activities similar to OHV maintenance. Maintenance work on trails in wilderness areas is accomplished by means of primitive skills using non-motorized/mechanized traditional hand

tools such as crosscut saws, axes, and shovels; blasting; crushing or moving rock; cutting and utilizing down logs; and rigging to move materials.

d. Hazard tree removal along roads, trails, campgrounds, and other Forest Service high-use areas: Dead or dying trees and/or hazard trees within falling distance of roads and trails will be felled and/or removed for public safety. Harvest of hazard trees includes both mechanical and conventional harvest systems. After harvest, slash treatment will include hand/machine piling and pile burning adjacent to roads. Where fuel loading is not an issue, slash may be lopped with chainsaw and scattered by hand. Created skid trails will have waterbars constructed along the length of the skid trail for erosion control.

3. Maintenance of developed recreation sites and administrative infrastructure: Recreation on National Forest lands includes a wide range of environmentally-sustainable developed and dispersed recreation opportunities in developed sites and dispersed areas such as trails, rivers or lakes, wilderness, and general forest areas.

   Developed recreation includes family and group campgrounds, day use picnic areas, trailheads, snow parks, visitor centers, visitor information sites, fire lookouts, corrals, boat ramps, pastures, and developed ski areas. Management of these facilities includes operation and maintenance/minor repair of internal site roads and buildings, trails, ski slopes, boundary fencing, picnic tables and fire rings, restrooms, water systems, dumpsters, regulatory signs and bulletin boards, barrier logs, camp host sites, concrete parking slabs, and interpretive panels in addition to administration of the site visitors.

   This program includes the routine maintenance of administrative facilities, and minor re-construction to replace or rehabilitate outdated facilities and associated infrastructure located on National Forest lands in the Sierra Nevada. Forest Service facilities include buildings, fire stations, work centers, permanent field camps, ranger stations, visitor centers, visitor information sites, public water systems, sanitation systems, camps, towers, pipelines, stream gauging stations, water storage and conveyance facilities, and other permanent or semi-permanent structures and infrastructure associated with Forest Service-administered facilities. Facilities on National Forests operated and maintained by the private sector through easements or special use authorizations including work and organizational camps, concession sites, ski areas, electronic and communication sites, public water and sanitation systems, power transmission lines, pipelines, research equipment and structures, and access routes to private land in-holdings. These third-party non-Forest Service administrative sites are generally administered or operated through special use permits.

   This program includes vegetation management of both native and non-native species such as routine felling and/or removal dead/dying trees and hazard trees within falling distance of administrative facilities for public safety; and fuels reduction activities cut smaller vegetation and the material is either chipped or piled and burned.

4. Special Use Permits: This program covers a variety of activities requiring permits that occur on National Forests in the Sierra Nevada. The activities include:

   a. Permitted activities: This includes pack station operations such as day rides, spot trips, dunnage drops and client camping in wilderness and non-wilderness areas using system and approved user trails, outfitting/guiding operations in wilderness and non-wilderness, river rafting, organization camps, and recreational residences.

b. Permitted temporary activities: This includes the temporary use of National Forest lands for activities such as weddings, commercial filming and commercial still photography, training, commercial special events, vendors, and organized temporary events such as races, rides, regattas and festivals.

c. Facilities management: This includes vegetation management at facilities such as hazard tree felling, vegetation clearing, chipping and pile burning.

d. Communication sites: This broadcast radio and television, cable television, microwave for industrial and common carriers, cellular telephone, land-line telephone, and amateur and mobile radio transmission and repeater sites.

e. Transportation related activities: This include facilities such as avalanche control centers, maintenance yards, storage facilities, airport navigation beacons, helicopter landing sites, Department of Transportation easements, private party easements, and rights of way.

f. Utilities activities: This includes underground and overhead alignments for utilities including fiber optic, telephone, cable, water, sewer, gas and electricity transmission and distribution facilities, and specific sites for wells, water tanks, springs, dams, pump stations, fish ladders, water diversion, reservoirs, snow pillows, snow survey towers and cabins, and other utilities.

g. Community use and public information: This includes permitted land uses such as non-commercial group use, monuments, markers, signs, benches, interagency visitor centers, amphitheaters, museums, transit centers, and cultural centers.

h. Non-timber forest product associated activities: This includes commercial and non-commercial collection of materials such as firewood, plants, seeds, mushrooms, berries, biomass, pine cones, insects, extractives, Christmas trees, boughs and apiaries.

5. Rangeland Management: This program includes activities related to the development, administration, and protection of range resources, and includes the permitting and regulation of grazing use of all kinds and classes of livestock on National Forest lands in the Sierra Nevada. The animals are cattle, sheep, goats, horses, and saddle stock. A primary purpose of the rangeland management program is to provide forage for commercial livestock operations. Grazing also can be a means of managing vegetation to meet other resource management objectives, such as fuels management, invasive species management, wildlife habitat improvement, and reduction of competing vegetation in plantations.

An allotment is a designated area of land capable and suitable for domestic livestock grazing. The Forest Service has an established process for grazing administration. Term grazing permits are generally issued for a period of 10 years, and authorize a permittee to graze livestock on their designated allotment(s).

Grazing on an allotment is conducted in accordance with an Allotment Management Plan which is incorporated into the term grazing permit. National Forests develop and implement allotment management plans to ensure livestock use meets rangeland management objectives. Allotment Management Plans identify the grazing strategies needed to meet rangeland and other conservation objectives within the allotment. The Allotment Management Plan establishes grazing systems, stocking rates, kind and class of livestock, period of use, season of use, livestock distribution, and range improvements. It is implemented through Annual Operating Instructions. Annual Operating Instructions include annual adjustments to management based

on monitoring and site specific objectives, and are revised to reflect current project design criteria.

The activities associated with the range management program include livestock handling, moving, herding, gathering, salting, and other ordinary husbandry practices. Range management includes implementation and maintenance of structural and non-structural improvements to the allotments. Structural improvements are permanent features designed to facilitate livestock management and control distribution and movement of livestock, such as dams, impoundments, ponds, pipelines, fences, corrals, wells, and trails. Non-structural improvements include cutting, chaining, and planting.

6. Biological Resources Management: Activities that survey or monitor species, enhance, or restore their habitats are included in the Biological Resources Management Program. The primary restoration implemented for mountain yellow-legged frogs is the removal of nonnative fish species from lake habitats. This program also includes restoration, protection, maintenance, or improvement of habitats, such as stream and/or meadow restoration, planting, blocking/disguising unauthorized vehicle or trail routes, elimination of exotic weeds, fencing, and removal of trash.

7. Invasive Species Management: This program includes activities that detect, prevent, control, and eradicate invasive species. The activities may include, but are not limited to, surveys for the early detection of non-native plant and animal species in order to contain and control them; monitoring known occurrences including those that have been treated, and treating or re-treating occurrences; operation of inspection stations; manual removal; chemical and biological removal; thinning and fire; and outreach and education.

   Invasive plant control includes manual removal and the use of selected herbicides. Most of the activities involving removal of non-native plants involve little ground disturbance. Treatment activities include direct removal of weeds by hand; a "weed wrench" or by cutting with hand-tools or with a chainsaw for larger invasive shrubs; herbicides at administrative and developed sites, as well as other locations. Focused ground based application methods such as low volume foliar-spraying, cut and daub, basal bark, or frill methods of herbicide application may be used. Herbicides are not directly applied within any riparian or wetland areas and application follows U.S. Environmental Protection Agency (EPA) label instructions. This biological opinion, however, does not cover application of pesticides/herbicides other than stump application of borax under various trade names such as Sporax.

   This program includes the removal of non-native animals such as bullfrogs, and certain non-native fish. These activities generally do not result in ground disturbance but involve trapping, electro-shocking, or other techniques.

8. Mining: The mining program includes activities seeking and removing minerals under the general mining laws, leasable minerals under the mineral leasing laws, and common variety minerals which can be sold or leased. Under the mineral leasing laws, leases can be issued for energy development. In addition, mineral sales can authorize the extraction of common variety minerals such as sand, gravel or stone for landscaping or building. Mining on National Forest lands in the Sierra Nevada includes aggregate, placer, hardrock, hydraulic, and suction-dredge operations to the extent permitted by the State of California. The activities in this program include exploration, experimental drilling, land surveys, site clearing, road construction and use, use of heavy equipment, water drafting, and the development and operation of mining camps.

The Forest Service conducts reclamation of abandoned mines. Under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)(42 U.S.C. 9601 *et seq.*, as amended), the Forest Service responds directly to releases or threatened releases of hazardous substances from closed and abandoned hazardous waste sites that may endanger public health or the environment. This includes site re-grading and stabilization; removal of mining equipment, structures, and debris; revegetation; road reconstruction and removal; and abating safety hazards by removing hazardous substances and closing underground openings.

9. Lands (Real Estate): This program consists of the acquisition, development, and reclamation of lands and facilities located on National Forest lands in the Sierra Nevada. It includes surveys and marking of property boundaries typically involving one or two people with surveying equipment; boundaries marked with fence posts, tags nailed to trees, or buried aluminum pipe with information caps; and occasionally important corner posts or survey monuments must be set in the ground with concrete.

Project Monitoring

The Forest Service will develop and implement a monitoring plan to evaluate the success of Forest Service conservation measures in minimizing effects to the three amphibian species and their habitats from management activities. The monitoring plan will be developed cooperatively with the Service, as well as other agencies and entities to the extent possible, and submitted to the Service for final review and approval.

There are three components to the monitoring plan:

1. Compliance/Implementation: Determination of whether each project and associated activities followed the project description as described by the Forest Service. This will be annually reported to the Service by December 31 of each year. The initial report will cover the period from the issuance of the programmatic biological opinion (December 19, 2014) through December 31, 2017.

2. Take: The project-specific and total amount and type of incidental take for each of the three listed amphibians will be annually reported to the Service by December 31 of each year. The initial report will cover the period from the issuance of the programmatic biological opinion (December 19, 2014) through December 31, 2017.

3. Effectiveness: The Forest Service will collect and analyze data regarding the success of the conservation measures in mitigating and minimizing adverse effects on the three listed species, suitable habitat and the primary constituent elements of designated Critical Habitat. In 2017, the Forest Service completed the final Amphibian Effectiveness Monitoring Pilot Report (Brown *et al.* 2017), which evaluated a variety of methodologies, developed by a team of amphibian and meadow monitoring experts, for monitoring the effectiveness of BMPs and S&Gs. The Forest Service will use the results of this study, as well as monitoring data collected during the 2017 field season, to inform and adjust the Forest Service's Three Sierra Nevada Amphibian Effectiveness Monitoring Program. The Forest Service will retain the responsibility for oversight, implementation, analysis and reporting.

    a. The findings will be utilized in an adaptive management process to modify the programmatic project description and conservation measures, as needed.
    b. For the Yosemite toad, the monitoring program will focus on the effects on meadow hydrology.

Programmatic Conservation Measures

Conservation measures for each program have been proposed by the Forest Service. These measures are designed to reduce adverse effects to the three listed amphibians. Their full implementation by the Forest Service is an essential component of this programmatic consultation. The conservation measures are intended to avoid and minimize the effects of projects in the nine Forest programs on the Sierra Nevada yellow-legged frog, the Northern Distinct Population Segment of the mountain yellow-legged frog, and Yosemite toad. These measures are the appropriate S&Gs and BMPs from the individual Forest Land and Resource Management as amended by the 2004 Sierra Nevada Forest Plan Amendment (USFS 2004), and Region 5 Hydrologic Best Management Practices (See Appendices A and B of this biological opinion for a list of the applicable S&Gs and BMPs proposed by the Forest Service). These S&Gs and BMPs are treated as minimums. Site-specific application of each will be tailored to exact project landscapes, topography, geology, soils, etc. and result in greater specificity, thereby providing more stringent protections for the three listed amphibians and their habitat. Some S&Gs and BMPs are designed to be implemented for all of the nine Forest programs, while others are specific to a single program. The majority of the conservation measures are intended to protect environmental resource values such as water quality, and/or sensitive habitats. In addition to the S&Gs and BMPs, at the project level the nine Forests implement additional "Design Criteria" that specify how these will be implemented to meet site-specific desired conditions, such as avoiding or minimizing ongoing impacts to known occurrences of the three amphibian species. The Forest Biologist will work with the project manager to develop any minor project specific adjustments. These specific Design Criteria actions will be included as conservation measures in the Batch Process for individual projects. They also will be documented in a written report submitted after project completion to the Service.

Analytical Framework for the Jeopardy Analysis

The following analysis relies on four components to support the jeopardy determination for the Yosemite toad, Sierra Nevada yellow-legged frog, and Northern Distinct Population Segment of the mountain yellow frog: (1) the **Status of the Species**, which evaluates the species' range wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the **Environmental Baseline**, which evaluates the condition of these species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the **Effects of the Action**, which determines the direct and indirect effects of the proposed programmatic Federal action and the effects of any interrelated or interdependent activities on these species; and (4) **Cumulative Effects**, which evaluates the effects of future, non-Federal activities in the action area on these three species.

In accordance with the implementing regulations for Section 7 and Service policy, the jeopardy determination is made in the following manner: The effects of the proposed programmatic Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the current status of the Yosemite toad, Sierra Nevada yellow-legged frog, and Northern Distinct Population Segment of the mountain yellow frog. Additionally, for non-Federal activities in the action area, we will evaluate those actions likely to affect these species in the future, to determine if implementation of the proposed programmatic action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of them in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the Yosemite toad, Sierra Nevada yellow-legged frog, and Northern Distinct Population Segment of the mountain yellow frog, and the role of the action area in providing for those needs as the context

for evaluating the significance of the effects of the proposed programmatic Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Analytical Framework for Adverse Modification

Section 7(a)(2) of the ESA requires that Federal agencies insure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. A final rule revising the regulatory definition of "destruction or adverse modification" (DAM) was published on February 11, 2016 (81 FR 7214). The final rule became effective on March 14, 2016. The revised definition states:

> "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features".

The DAM analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which describes the range-wide condition of the critical habitat in terms of the key components (i.e., essential habitat features, primary constituent elements, or physical and biological features) that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the critical habitat overall for the conservation/recovery of the listed species; (2) the *Environmental Baseline*, which analyzes the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat in the action area for the conservation/recovery of the listed species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated and interdependent activities on the key components of critical habitat that provide for the conservation of the listed species, and how those impacts are likely to influence the conservation value of the affected critical habitat; and (4) *Cumulative Effects*, which evaluate the effects of future non-Federal activities that are reasonably certain to occur in the action area on the key components of critical habitat that provide for the conservation of the listed species and how those impacts are likely to influence the conservation value of the affected critical habitat.

For purposes of making the DAM determination, the Service evaluates if the effects of the proposed Federal action, taken together with cumulative effects, are likely to impair or preclude the capacity of critical habitat in the action area to serve its intended conservation function to an extent that appreciably diminishes the rangewide value of critical habitat for the conservation of the listed species. The key to making that finding is understanding the value (i.e., the role) of the critical habitat in the action area for the conservation/recovery of the listed species based on the *Environmental Baseline* analysis.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". For the actions proposed for this programmatic consultation, the action area includes the nine National Forests covered under this programmatic biological opinion.

Status of the Species and Environmental Baseline

Sierra Nevada Yellow-legged Frog and Northern Distinct Population Segment of the Mountain Yellow-legged Frog

The Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog were both listed as endangered species on April 29, 2014, under the Endangered Species Act of 1973, as amended (Service 2014).

The mountain yellow-legged frog was originally described as a subspecies of the foothill yellow-legged frog (*Rana boylii*). Populations in the Sierra Nevada were considered to be subspecies *sierrae*, and populations inhabiting three mountain ranges in southern California were thought to represent subspecies *muscosa*. Later analysis of additional morphological data indicated what was considered *R. boylii sierrae* and *R. boylii muscosa* were instead more likely to be subspecies of *Rana muscosa* (Zweifel 1955). Later, Macey *et al.* (2001) conducted a phylogenetic analysis of mitochondrial deoxyribonucleic acid (DNA) sequences of the mountain yellow-legged frog and concluded the species consisted of two major genetic lineages comprised of three distinct groups in the Sierra Nevada, and a fourth distinct group in the mountains of southern California.

Based on mitochondrial DNA, morphological information, and acoustic studies, Vredenburg *et al.* (2007) concluded the mountain yellow-legged frog in the Sierra Nevada consists of two distinct species - *Rana muscosa* and *R. sierrae*. *R. sierrae*, or the Sierra Nevada yellow-legged frog, is endemic to the northern and central Sierra Nevada and adjacent Nevada ranging from north of the Feather River including the Plumas and southern edge of the Lassen National Forests, south to the Monarch Divide on the west side of the Sierra Nevada crest in the Sierra National Forest, and near Independence Creek on the east side of the Sierra Nevada crest in the Inyo National Forest. In the Sierra Nevada, *R. muscosa* ranges from the Monarch Divide south to Dunlap and Taylor meadows in the Sequoia National Forest (California Department of Fish and Wildlife 2011; Vredenburg *et al.* 2007). *R. muscosa* also occurs as a Distinct Population Segment in the Transverse and Peninsular Ranges in southern California, where it is listed as an endangered species. In the Sierra Nevada, the taxon ranges in elevation from approximately 4,500 feet to more than 12,000 feet (Vredenburg *et al.* 2005). However, the distribution of the Northern Distinct Population Segment of the Mountain yellow-legged frog appears to extend below 4,500 feet in elevation at higher latitudes; for example, on the Plumas National Forest (USFS 2014). Eight-percent of the observations on the Plumas National Forest are below 4,500 feet elevation; of which, thirty-one of the observations were between 3,500 and 4,500 feet in elevation.

Physical Description

The body length (snout to vent) of the adult mountain yellow-legged frog ranges from 1.5 to 3.25 inches (Dodd 2013b; Stebbins and McGinnis 2012; Lanoo 2005; Green *et al.* 2014; Jennings and Hayes 1994; Vredenburg *et al.* 2005; Wright and Wright 1949; Stebbins 1951; Zweifel 1955). Females average larger than males, and males have a swollen, darkened thumb base. Dorsal (upper) coloration in adults is variable, exhibiting a mix of brown and yellow, but also gray, red, or green-brown, and usually a pattern of dark spots. These spots may be large (0.25 inch) with a few, smaller and more numerous spots, or a mixture of both. Irregular lichen- or moss-like patches may also be present on the dorsal surface. The belly and undersurfaces of the hind limbs of the mountain yellow-legged frog are yellow or orange colored, and this pigmentation may extend forward from the abdomen to the forelimbs. The adults may produce a distinctive mink or garlic-like odor when disturbed (Wright and Wright 1949; Stebbins 2003). Although these two species lack vocal sacs, they can vocalize in or out of water, producing what has been described as a flat clicking sound

(Zweifel 1955; Stebbins 2003). Mountain yellow-legged frogs have smoother skin, generally with heavier spotting and mottling dorsally, darker toe tips (Zweifel 1955), and more opaque ventral coloration (Stebbins 2003) than the foothill yellow-legged frog, which is a conspecific species in some portions of the Sierra Nevada.

The Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog can be distinguished from each other physically by the ratio of the lower leg (fibulotibia) length to snout vent length (Vredenburg *et al.* 2007). Typically, this ratio is greater than or equal to 0.55 for the northern Distinct Population Segment of the mountain yellow-legged frog and less than 0.55 for the Sierra Nevada yellow-legged frog. In addition, adult Northern Distinct Population Segment of the mountain yellow-legged frog generally has longer limbs than Sierra Nevada yellow-legged frogs.

Mountain yellow-legged frogs deposit their eggs in globular clumps, which are often somewhat flattened and roughly 1 to 2 inches in diameter (Stebbins 2003; Lannoo 2005; Vredenburg *et al.* 2005). When the eggs are close to hatching, egg mass volume averages 78 cubic inches (Pope 1999). An egg has three firm, jelly-like, transparent envelopes surrounding a grey-tan or black vitelline capsule or egg yolk (Wright and Wright 1949). The clutch size varies from 15 to 350 eggs per egg mass (Livezey and Wright 1945; Vredenburg *et al.* 2005). The development of the egg is temperature dependent. In laboratory breeding experiments, eggs took from 18 to 21 days at temperatures of 41 to 56 degrees Fahrenheit to hatch after being laid (Zweifel 1955).

Mountain yellow-legged frog tadpoles generally are mottled brown on the dorsal side with a faintly yellow venter or underside (Zweifel 1955; Stebbins 2003; Vredenburg *et al.* 2005). Their total length may reach a maximum of 2.8 inches, the body is flattened, and the tail musculature is wide at 1 inch or more before tapering into a rounded tip (Wright and Wright 1949). The mouth has a maximum of eight labial tooth rows (Stebbins 2003).

Current Range and Distribution

Since the mountain yellow-legged frog observations made by Grinnell and Storer (1924), a number of researchers have reported disappearances of these two listed amphibian species from significant portions of their historical ranges in the Sierra Nevada (Hayes and Jennings 1986; Bradford 1989; Bradford *et al.* 1994; Jennings and Hayes 1994; Stebbins and Cohen 1995; Drost and Fellers 1996; Knapp and Matthews 2000a; Vredenburg *et al.* 2005; Martin 1992; Heller 1960; Jenkins 1994).

The current distribution of the mountain yellow-legged frog is primarily restricted to publicly managed lands within National Forests and National Parks at high elevations in the Sierra Nevada. National Forests with extant populations include the Plumas National Forest, Lassen National Forest, Tahoe National Forest, Humboldt-Toiyabe National Forest, Lake Tahoe Basin Management Unit, Eldorado National Forest, Stanislaus National Forest, Sierra National Forest, Sequoia National Forest, and Inyo National Forest. National Parks with extant populations of mountain yellow-legged frogs include Yosemite National Park, Sequoia National Parks and Kings Canyon National Parks. Suitable habitat within the 9 Forests in the Sierra Nevada is indicated in Figures 1 and 2.

According to the Biological Assessment, the number of known occupied sites, such as lakes, ponds, meadows, and streams, is estimated to be around 1,245 sites for the Sierra Nevada mountain yellow-legged frog and 12 sites for the Northern Distinct Population Segment of the mountain yellow-legged frog. Eighty-one percent of the Sierra Nevada yellow-legged frog's range, and 51 percent of the Northern Distinct Population Segment of the mountain yellow-legged frog's range occur on Forest Service lands (California Department of Fish and Wildlife 2014a, 2014b). There are

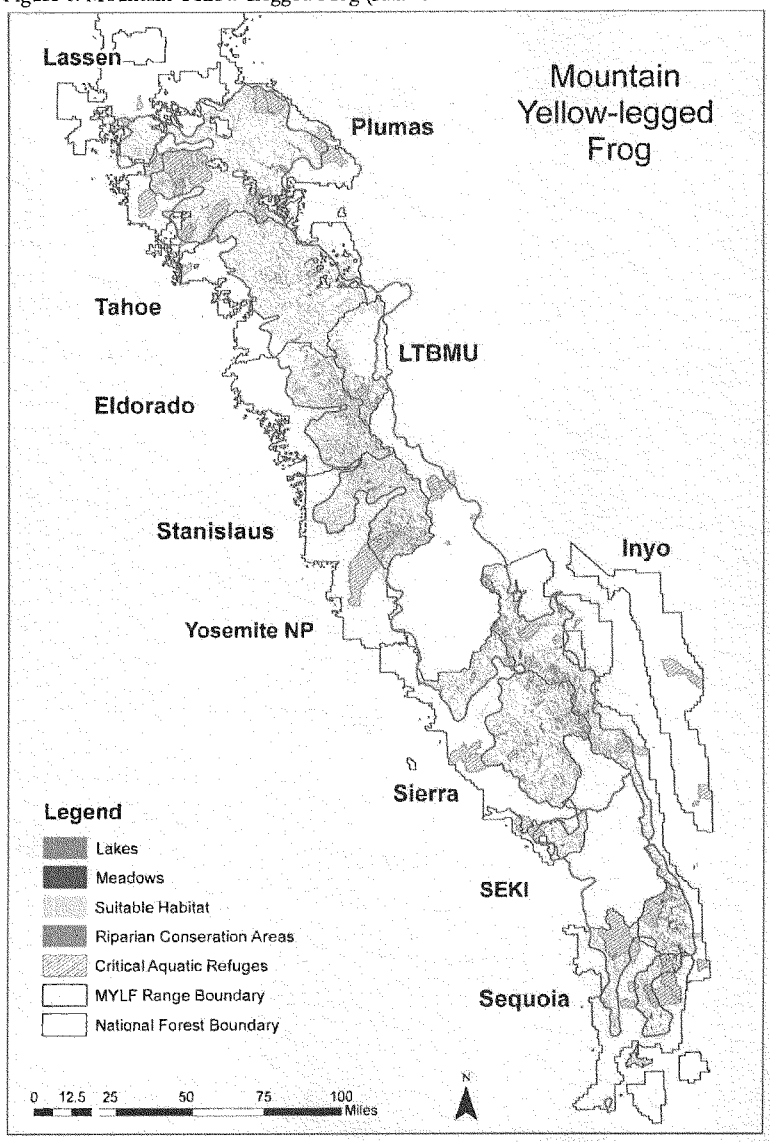
important caveats to these estimates of the number of occupied sites. First, in some cases multiple observations may have been counted for a specific site. Second, not all aquatic habitats have been surveyed, and given the complexity of aquatic habitats, definitions of sites vary among scientists and land managers. Third, more surveys for these species have occurred in lake habitats than in other habitats. Finally, these numbers do not necessarily represent populations; a single population may occupy multiple sites.

Habitat and Life History

The mountain yellow-legged frog currently and historically inhabited lakes, ponds, marshes, tarns, meadows, and streams, largely in areas that were glaciated during the Pleistocene at elevations ranging from 4,500 feet to 12,000 feet (California Department of Fish and Wildlife 2014a, 2014b; Zweitel 1955). The two listed amphibian species are highly aquatic (Stebbins 1951; Mullally and Cunningham 1956; Bradford *et al.* 1993). Adults typically are found sitting on rocks along the shoreline, usually where there is little or no vegetation (Mullally and Cunningham 1956). Although mountain yellow-legged frogs may use a variety of shoreline habitats, both tadpoles and adults are less common at shorelines that drop abruptly to a depth of 2 feet than at open shorelines that gently slope up to shallow waters of only 2 to 3 inches in depth (Mullally and Cunningham 1956; Jennings and Hayes 1994). The mountain yellow-legged frog is most abundant in high-elevation lakes and slow-moving portions of streams (Vredenburg *et al.* 2005; Zweifel 1955; Lannoo 2005; Mullally and Cunningham 1956). The borders of alpine ponds, lakes, and meadow streams above the tree line used by the two listed frogs are frequently grassy or muddy. The frog uses different aquatic habitats in various parts of its range, likely because of differences in availability. For example, the species is often found in streams in the northern and southernmost parts of its range where lakes are less common. At lower elevations within their historical ranges, they animals are known to be associated with rocky streambeds and wet meadows surrounded by coniferous forest (Vredenburg *et al.* 2005; Zweifel 1955; Zeiner *et al.* 1988). Adults use streams that vary from high-gradient channels replete with pools, rapids, and small waterfalls to reaches with marshy edges and sod banks (Brown *et al.* 2014; Foote *et al.* 2013; Zweifel 1955. Aquatic substrates vary from bedrock to fine sand, rubble consisting of rock fragments, and boulders (Zweifel 1955). Mountain yellow-legged frogs appear absent from the smallest creeks, possibly because these creeks have insufficient depth for adequate refuge and overwintering habitat (Jennings and Hayes 1994). Stream-dwelling yellow-legged frogs on the Plumas National Forest have been found in first order headwater streams to second order streams (Brown *et al.* 2014).

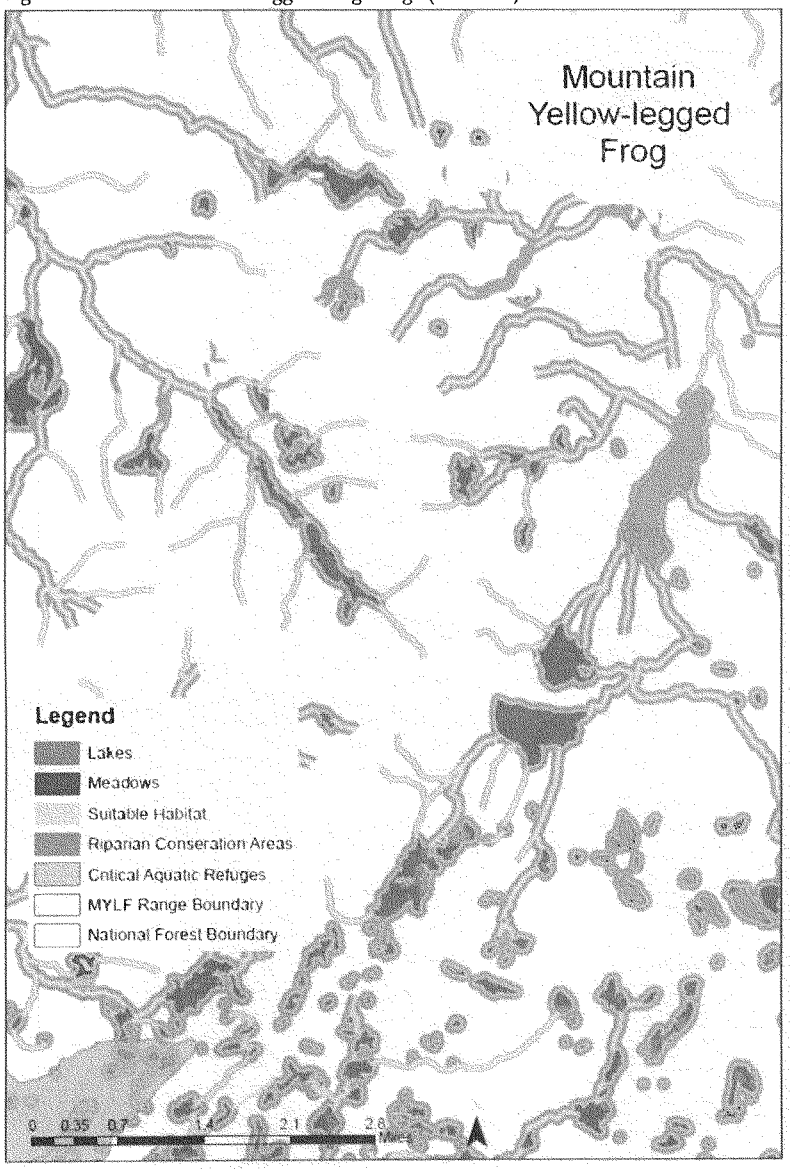
Mr. Randy Moore

Figure 1. Mountain Yellow-Legged Frog (Rana sierra and R. muscosa Norther DPS Range Map.



Mr. Randy Moore

Figure 2. Mountain Yellow-Legged Frog Range (Zoom In)



Mr. Randy Moore

In the central and southern Sierra, the mountain yellow-legged frog breeds most commonly in permanent, deep lakes (Knapp and Matthews 2000a; Knapp *et al.* 2000b). In Yosemite National Park, occupancy was associated with deep water, elevation, absence of fish, and meadow vegetation on shorelines (Knapp 2005a). Adult mountain yellow-legged frogs breed in the shallows of ponds or in inlet streams (Vredenburg *et al.* 2005). Breeding has been observed in relatively shallow sites (< 1 foot) that dry frequently, but successful recruitment will only occur in water bodies that hold water for the duration of the 2-3 year larval period, even if only a small fraction of water remains (Lacan *et al.* 2008). They emerge from overwintering sites immediately following snowmelt, and will move over ice to reach breeding sites (Pope 1999; Vredenburg *et al.* 2005). The females deposit their eggs underwater in clusters, which they attach to rocks, gravel, or vegetation, or under banks (Wright and Wright 1949; Stebbins 1951; Zweifel 1955; Pope 1999).

In lakes in the John Muir Wilderness and Kings Canyon National Park, the presence of tadpoles was associated with deep water depths, elevation, the absence of trout, higher proportions of silt, and degree of lake isolation (Knapp *et al.* 2000b). Frogs also breed less commonly in streams and meadows (Zweifel 1955). The larvae take two to three years to metamorphose into subadults (Bradford 1983; Zweifel 1955) and their deep water habitat protects them from freezing to death in the winter (Bradford 1983; Knapp *et al.* 2000b; Knapp 2005a). Habitat models, based on broad scale sampling throughout Yosemite National Park and portions of the John Muir Wilderness and Kings Canyon National Park, indicate that the probability of occupancy by mountain yellow-legged tadpoles increased as maximum lake depth increased from 0 to 13 feet or 16 feet and then remained relatively constant at greater depths (Knapp *et al.* 2000; Knapp 2005a). Desiccation of tadpoles in habitats that dry out during the summer was an important cause of mortality, and little evidence was found of winterkill in shallow water habitats (Lacan *et al.* 2008; Bradford 1983).

Bradford (1983) found that mountain yellow-legged frog die-offs sometimes result from oxygen depletion during winter in lakes less than 13 feet in depth. However, tadpoles may survive for months in nearly anoxic conditions in shallow lakes that are frozen to the bottom. Populations of mountain yellow-legged frogs have overwintered in lakes less than 5 feet deep that are assumed to have frozen to the bottom, and healthy frogs emerged the following July (Pope and Matthews 2001; Pope 1999). Radio telemetry indicated that the animals were utilizing rock crevices, holes, and ledges near shore, where water depths ranged from 0.7 foot to 5 feet (Pope and Matthews 2001). The granite surrounding these overwintering habitats probably insulates mountain yellow-legged frogs from extreme winter temperatures, provided there is an adequate supply of oxygen (Pope and Matthews 2001). In lakes and ponds that do not freeze to the bottom in winter, they may overwinter in the shelter of bedrock crevices as a behavioral response to the presence of introduced trout (Vredenburg *et al.* 2005).

Mountain yellow-legged frog tadpoles maintain a relatively high body temperature by selecting warmer microhabitats (Bradford 1984). During winter, tadpoles remain in warmer water below the thermocline, the transition layer between thermally stratified water. After spring overturn (thaw and thermal mixing of the water), they behaviorally modulate their body temperature by moving to shallow, near shore water when warmer days raise surface water temperatures. The tadpoles select the warmest temperature environments within an alpine lake, often using shallow shorelines during the day and moving offshore in the evening as surface temperatures cool (Bradford 1984). Warmer waters are conducive to faster development. During winter, tadpoles remain in warmer water below the thermocline, the transition layer between thermally stratified water. Tadpoles may take more than 1 year to mature (Wright and Wright 1949), and often require 2 to 4 years, to reach the metamorphosis stage in which they transform from tadpoles to frogs, depending on local climate conditions and site-specific variables (Bradford 1983; Bradford *et al.* 1993; Knapp and Matthews 2000b; Vredenburg *et al.* 2005).

The time required to reach reproductive maturity in mountain yellow-legged frogs is thought to vary between 3 and 4 years post-metamorphosis (Vredenburg *et al.* 2005; Zweifel 1955). Based on this, given the amount of time a tadpole takes to reach metamorphosis, it may take 5 to 8 years for a mountain yellow-legged frog to begin reproducing. Adults are long lived with a maximum recorded age of 14 years (Vredenburg *et al.* 2005). Under normal circumstances, adult survivorship from year to year is very high (Pope 1999).

After breeding, adults may disperse into a larger variety of aquatic habitats (Pope and Matthews 2001). They appear to use a restricted set of lakes that provide suitable microhabitats for breeding and overwintering, then disperse into a greater number of sites during the summer months for feeding (Pope and Matthews 2001; Matthews and Preisler 2010; Pope and Matthews 2001; Wengert 2000). Frogs commonly are found basking in open areas near cover and water (Grinnell and Storer 1924; Mullally and Cunningham 1956; Storer 1925). Mullally and Cunningham (1956) found individuals more commonly along shallow, rocky shorelines often interspersed with vegetation rather than areas with large boulders from talus slope or sandy unprotected shorelines. The animals use a variety of cover including vegetation, logs, and partially submerged trees. Different habitats are used seasonally. Individuals select undercut banks and willows in August and rocky habitats in September and October (Pope and Matthews 2001). Similar to tadpoles, the adults and subadults seek warmer water, and Bradford (1984) found the abundance of frogs within a lake was significantly associated with warmer water. During the late afternoon and evening, mountain yellow-legged frogs move to offshore waters that are less subject to night cooling (Bradford 1984). Mountain yellow-legged frog's display strong site fidelity and may return to the same overwintering and summer habitats from year to year (Pope 1999). In aquatic habitats of high mountain lakes, adults typically move only a few hundred yards (Pope and Matthews 2001; Pope 1999). In one telemetry study in lentic habitats, mountain yellow-legged frogs typically moved a few hundred feet during the active season (Brown *et al.* 2014; Pope and Matthews 2001). Distances greater than 0.621 mile have been recorded which included overland travel (Pope and Matthews 2001; Vredenburg *et al.* 2005). Moreover, given Barrowclough's (1978) caution that without extraordinary effort, population movement distances are consistently underestimated, the limited available data undoubtedly underestimate the movement patterns and capabilities of mountain yellow-legged frogs. At the scale of distances between lakes in many high Sierra basins, the data indicate that the species are capable of recolonizing other water bodies on a local scale. However, more studies of dispersal and movement will be necessary to elucidate their seasonal movements.

Adult mountain yellow-legged frogs move between breeding, feeding, or non-breeding active season, and overwintering habitats during the course of the year (Pope 199a; Matthews and Preisler 2010). Adults sometimes travel over ice or snow to reach preferred breeding locations early in the season without apparent ill effects (Pope 199a; Vrendenburg *et al.* 2005). Mullally and Cunningham (1956) stated that the animal avoids crossing dry ground over short distances, but individuals have been recorded moving overland for distances of 217 feet to 1312 feet (Pope and Matthews 2001; Vredenburg *et al.* 2005). However, the physical conditions under which the movements occurred are unclear. Movement of adults between habitats used in their seasonal rounds may be a function of the relative proximity of habitats that can fulfill their seasonal requirements, such as breeding, foraging, or overwintering; if all habitats that adults need are close to each other, seasonal movements may not be as great (Brown *et al.* 2014). In this context, trout occupancy in selected water bodies may force mountain yellow-legged frogs to move greater distances to fulfill their habitat requirements.

Mr. Randy Moore

Status and Threats

The mountain yellow-legged frog is imperiled by a variety of factors, especially invasive trout, chytrid fungus, and global climate change (Bradford 1989, 1991; Bradford *et al.* 1998; 1994; Drost and Fellers 1996; Lannoo 2005; Moyle *et al.* 1996; Knapp and Matthews 2000a; Armstrong and Knapp 2004; Knapp 2005a, 2005b; Finlay and Vrendenburg 2007; Knapp *et al* 2007; Lacan *et al.* 2008; California Department of Fish and Wildlife 2011; Bradford *et al.* 2011).

Demographic data on historical populations of mountain yellow-legged frogs are anecdotal and limited. Essentially, no data actually precede the fish-planting era in the high mountain lakes and streams; the earliest recorded plantings date from the mid-1800s (Knapp 2005a). Nevertheless, mountain yellow-legged frog data from the earliest 20th Century dates available describe them as having been abundant in aquatic habitats in the high Sierra Nevada. Grinnell and Storer (1924) reported that it [=Sierra Nevada yellow-legged frog] was "the commonest amphibians in most parts of the Yosemite section. Its total range is ...less than that of the Pacific tree-toad [=Pacific tree frog]; but it numbers, especially at the higher altitudes, far exceed those of the smaller species. This frog is the species most likely to come to the attention of fishermen and others who may walk along the banks of Sierran streams and lakes". They also reported that "Certain of the lakes in the higher parts of the Yosemite contain large numbers of yellow-legged frogs in ...tadpole and adult conditions" (Grinnell and Storer 1924).

The decline of the mountain yellow-legged frog was first recorded in the 1970's when large populations were reduced in size to near extirpation (Bradford 1991). Subsequent surveys of formerly occupied sites found few remaining populations (Bradford *et al.* 1994; Drost and Fellers 1996). Between 1988 and 1991, Bradford *et al.* (1994) resurveyed sites historically known to support mountain yellow-legged frogs, based on surveys from 1955 to 1979. Animals were not detected at 27 historical sites on the Kaweah River; they were observed at 52 percent of the historical sites within Sequoia and Kings Canyon National Parks, and at 12.5 percent of the historical sites outside of these two protected locations. When the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog are combined for the purpose of analysis, into one species, the mountain yellow-legged frog, this resurvey effort detected them at 19.4 percent of historical sites (Bradford *et al.* 1994). Drost and Fellers (1996) repeated Grinnell and Storer's early 20th century surveys, and reported their presence at 2 of 14 historical sites. The two positive sightings consisted of a single tadpole at one site and a single adult female at the second. They located 17 additional sites with suitable mountain yellow-legged frog habitat, and detected three additional populations.

Davidson *et al.* (2002) reviewed 255 previously documented locations with mountain yellow-legged frog based on Jennings and Hayes (1994) throughout the historical range, and they concluded that 83 percent of these sites no longer support extant populations. Vredenburg *et al.* (2007) compared recent surveys from 1995 to 2004 with museum records of specimens collected between 1899 to 1994 and found that 93.3 percent of locations with historic records of the Sierra Nevada yellow-legged frog sites, and 95.2 percent of the sites with historic records of the Northern Distinct Population Segment of the mountain yellow-legged frog were extirpated. The California Department of Fish and Wildlife (2014a, 2014b) updated the Vredenburg *et al.* (2007) study utilizing historic locality records from museum specimens during the same time interval (1899–1994), and included updated recent locality information with additional survey data (1995–2010). These recent surveys failed to detect any extant frog populations within 0.63 mile of 220 of 318 localities with historic Sierra Nevada yellow-legged frog records and 94 of 109 localities with historic mountain yellow-legged frog records. Based on this study, the estimated loss from historic occurrences is 69

percent for the Sierra Nevada yellow-legged frog and 86 percent for the Northern Distinct Population Segment of the mountain yellow-legged frog.

In 2002, 302 water bodies known to have been occupied by the mountain yellow-legged frog and 744 sites where the species had not been detected were resurveyed between 1995 and 1997 (Knapp 2005a). Animals at 59 percent of the previously occupied sites, and 8 percent of previously unoccupied sites were recolonized (Knapp 2005a). These data suggest an extirpation rate five to six times higher than the colonization rate within this study area. The documented extirpations appeared to have occurred non-randomly across the landscape, typically spatially clumped, and included the disappearance of all or nearly all of the mountain yellow-legged frog populations in a watershed (Knapp 2005a). The California Department of Fish and Wildlife (2014a, 2014b) assessed data from sites where multiple surveys were completed since 1995 at least 5 years apart. The Sierra Nevada yellow-legged frog was not detected at 45 percent of sites where they previously had been confirmed, and the mountain yellow-legged frog including the endangered Southern Distinct Population Segment, was not detected at 81 percent of the historically occupied sites. These data combined with the Forest Service's monitoring data suggest that declines continued into the 1990s.

The Forest Service conducted bioregional monitoring for the mountain yellow-legged frog on National Forest lands within the species' range in the Sierra Nevada as part of their Sierra Nevada Amphibian Monitoring Program (Brown *et al.* 2014). This monitoring effort provided scientifically-based estimates for statistical comparisons of occupancy and relative abundance across 5-year monitoring cycles based on a sample of 208 watersheds (Brown *et al.* 2014). The results of this monitoring, from 2002-2009, found mountain yellow-legged frog breeding activity in 4 percent of watersheds rangewide, and the species has declined in both distribution and abundance. Evidence of breeding was found in only 47 percent of watersheds where the animal had been found relatively recently (1990-2001), and in only 2 percent of watersheds where the species had last been observed prior to 1990. Moreover, relative abundances were low; only an estimated 9 percent of occupied watersheds were large, numbering more than 100 frogs or 500 tadpoles, and more than half of the watersheds (57 percent) had fewer than 20 animals (>10 tadpoles and >10 adults or subadults) (Brown *et al.* 2014).

The introduction of trout to historically fish-free lakes in the Sierra Nevada reduced the distribution and abundance of the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog (Bradford 1989; Knapp and Matthews 2000a; Knapp 2005a). Prior to the mid-Nineteenth Century, almost all lakes and associated streams in the Sierra Nevada above 6000 feet were fishless (Moyle *et al.* 1996). As a result of 150 years of fish stocking throughout the region, however, all watersheds now contain as many as five non-native trout species (Forest Service 2013b). Currently, these areas may be functioning as population sinks for the mountain yellow-legged frog because the fish are either self-sustaining or their reintroduction to waterways and waterbodies imperils the amphibians.

The biological and ecological characteristics of the mountain yellow-legged frog make it especially vulnerable to predation and subsequent extirpation by introduced trout (Bradford 1989; Bradford *et al.* 1998; Finlay and Vredenburg 2007; Knapp and Matthews 2000a; Knapp *et al.* 2011). First, adult mountain yellow-legged frogs are highly aquatic and inhabit alpine lakes, most of which now contain trout. Second, in contrast to the tadpoles of other Sierra Nevada frog species that complete their metamorphosis to their terrestrial stage in a single summer, mountain yellow-legged frog larvae generally require at least two years to complete metamorphosis. This overwintering requirement restricts successful breeding and development to permanent water bodies that typically are deeper than six feet, however, they may be subject to predation by introduced trout in these locations (Brown *et al.* 2014; Bradford 1983; Knapp and Matthews 2000a; Mullally and Cunningham 1956).

And third, by excluding the mountain yellow-legged frog from deep lakes, trout increase the isolation of the remaining populations of these amphibians.

In 2000, the California Department of Fish and Wildlife declared that no waters would be approved for fish stocking in which the mountain yellow-legged frog were present or where the presence of this animal was unknown due to a lack of recent surveys (California Department of Fish and Wildlife 2011). The California Department of Fish and Wildlife reduced the number of high elevation Sierra Nevada waters stocked by 77 percent (California Department of Fish and Wildlife 2011). This was due in part to efforts to eliminate stocking of waters in the immediate vicinity of mountain yellow-legged frog populations, but also because of the results of resource assessments that showed that many trout populations were self-sustaining and did not require stocking to persist (California Department of Fish and Wildlife 2011).

Another significant threat to the two listed amphibians is chytrid fungus (*Batrochytridium mycosis* = *Bd*). This fungus may have arrived in the Sierra Nevada in the 1960s or 1970s (Vredenburg *et al.* 2010) and is now present in most aquatic habitats in this bioregion. *Bd* is a waterborne fungus which is transmitted by a free-swimming zoospore that infects the keratinized tissue of amphibian skin (Berger *et al.* 1998). It disrupts critical skin functions such as osmoregulation (Voyles *et al.* 2007, 2009). Post-metamorphic frogs are most susceptible to the disease. It is responsible for amphibian declines and extinctions worldwide (Skerratt *et al.* 2007; Longcore *et al.* 1999; Mao *et al.* 1999). The chytrid fungus has contributed to widespread mountain yellow-legged frog declines throughout the Sierra Nevada (Briggs *et al.* 2010; Rachowicz *et al.* 2006; Vredenburg *et al.* 2010). Adults may shed *Bd* and persist with low levels of infection, but given their highly aquatic habitat requirements, likely are reinfected by tadpoles that can carry high infection loads (Briggs *et al.* 2010, Vredenburg *et al.*, 2010). Some populations appear to be persisting with chytrid at reduced abundances (Briggs *et al.* 2010). Research is underway to better understand the epidemiology of *Bd* in the mountain yellow-legged frog and to attempt to develop effective treatments (Stice and Briggs 2010; Vredenburg *et al.* 2010).

The majority of remaining mountain yellow-legged frog populations are small (Brown *et al.*, 2011) and many are isolated (Bradford *et al.* 1993; California Department of Fish and Wildlife 2011; Knapp *et al.* 2007). Small and isolated populations are vulnerable to stochastic events, such as severe weather or predation that can lead to their decline and extirpation (Shaffer 1981). Small populations also have increased chance of genetic drift and inbreeding, which can lead to losses in genetic variation (Service 2014). The high degree of site fidelity also increases the vulnerability of small populations if frogs continue to return to habitats that are no longer suitable due to fish introductions or climate change. Given the few populations remaining in the Sierra Nevada, losses of even a few populations of the mountain yellow-legged frog may be significant.

Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (California Climate Action Team 2006; U.S. Global Change Research Program 2013). As global temperatures continues to rise, habitats are moving northward and upward in elevation, others will be eliminated, but in the near future, range contractions or extinctions of some species are more likely than simple northward or upslope shifts and this may be especially pronounced for Sierra amphibians owing to habitat fragmentation and the relative lower dispersal ability of these species. The Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog have short active seasons, overwinter in aquatic habitats for about nine months each year, and require perennial water for reproduction (Bradford 1983, Lacan et al. 2008; Pope and Matthews 2001; Zweifel 1955). Reduced snow pack and increased evapotranspiration may result in desiccation of breeding areas, which in turn, may reduce their breeding success (Lacan et al. 2008). Rising temperatures and early snowmelt may influence the timing of mountain yellow-legged frog reproduction, and reduce the time available for tadpole

development, and adversely affecting on survivorship (Blaustein et al. 2010; Walls et al. 2013). Global Climate Change is highly likely to adversely influence ground water transport, reduced persistence of surface water that leads to lower water levels available for eggs, tadpoles, breeding, and other life history stages of the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog. Therefore, ongoing Global Climate Change is highly likely to imperil these three listed species and the resources, including the aquatic areas, necessary for their survival, as climate change effects become more pronounced.

Status of Critical Habitat for the Sierra Nevada Yellow-legged Frog and Northern Distinct Population Segment of the Mountain Yellow-Legged Frog

Approximately 1,082,147 acres of critical habitat has been designated for the Sierra Nevada yellow-legged frog in Plumas, Lassen, Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Alpine, Mariposa, Mono, Madera, Tuolumne, Fresno, and Inyo Counties, California (Service 2016). Critical habitat for this species was designated as three units encompassing 24 subunits. The critical habitat units and subunits constitute the Service's current best assessment of areas that meet the definition of critical habitat for the Sierra Nevada yellow-legged frog. The 24 sub-units were known to be occupied when critical habitat was designated and the Service assumes these sub-units are currently occupied. Of the 1,082,147 acres, approximately 624,904 acres occurs on Forest Service lands covered under this programmatic biological opinion. Critical habitat occurs on the following forests: Lassen, Plumas, Tahoe, Lake Tahoe Basin Management Unit, Eldorado, Stanislaus, Sierra, and Inyo.

Approximately 221,498 acres of critical habitat has been designated for the northern DPS of the mountain yellow-legged frog in Fresno, Inyo and Tulare Counties, California (Service 2016). Critical habitat was designated in two units and seven subunits. The critical habitat units and subunits constitute the Service's current best assessment of areas that meet the definition of critical habitat for the northern DPS of the mountain yellow-legged frog. The seven subunits were known to be occupied when critical habitat was designated and the Service assumes these sub-units are currently occupied. Of the 221,498 acres, approximately 22,018 acres occurs on Forest Service lands covered under this programmatic biological opinion (the Sequoia and Inyo National Forests).

The Service (2016) determined that the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog require the following physical or biological features: (1) space for individual and population growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing (or development) of offspring; (5) habitats protected from disturbance or representative of the historical, geographic, and ecological distributions of the species.

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, the Service (2016) determined that the primary constituent elements specific to the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog are:

(1) Aquatic habitat for breeding and rearing. Habitat that consists of permanent water bodies, or those that are either hydrologically connected with, or close to, permanent water bodies, including, but not limited to, lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), pools (such as a body of impounded water contained above a natural dam), and other forms of aquatic habitat. This habitat must:

(a) For lakes, be of sufficient depth not to freeze solid (to the bottom) during the winter 5.6 feet, but generally greater than 8.2 feet, and optimally 16.4 feet or deeper (unless some other refuge from freezing is available).
(b) Maintain a natural flow pattern, including periodic flooding, and have functional community dynamics in order to provide sufficient productivity and a prey base to support the growth and development of rearing tadpoles and metamorphs.
(c) Be free of introduced predators.
(d) Maintain water during the entire tadpole growth phase (a minimum of 2 years). During periods of drought, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but they may still be considered essential breeding habitat if they provide sufficient habitat in most years to foster recruitment within the reproductive lifespan of individual adult frogs.
(e) Contain:
(i) Bank and pool substrates consisting of varying percentages of soil or silt, sand, gravel, cobble, rock, and boulders (for basking and cover);
(ii) Shallower microhabitat with solar exposure to warm lake areas and to foster primary productivity of the food web;
(iii) Open gravel banks and rocks or other structures projecting above or just beneath the surface of the water for adult sunning posts;
(iv) Aquatic refugia, including pools with bank overhangs, downfall logs or branches, or rocks and vegetation to provide cover from predators; and
(v) Sufficient food resources to provide for tadpole growth and development.

(2) Aquatic nonbreeding habitat (including overwintering habitat). This habitat may contain the same characteristics as aquatic breeding and rearing habitat (often at the same locale), and may include lakes, ponds, tarns, streams, rivers, creeks, plunge pools within intermittent creeks, seeps, and springs that may not hold water long enough for the species to complete its aquatic life cycle. This habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult mountain yellow-legged frogs. Aquatic nonbreeding habitat contains:
(a) Bank and pool substrates consisting of varying percentages of soil or silt, sand, gravel, cobble, rock, and boulders (for basking and cover);
(b) Open gravel banks and rocks projecting above or just beneath the surface of the water for adult sunning posts;
(c) Aquatic refugia, including pools with bank overhangs, downfall logs or branches, or rocks and vegetation to provide cover from predators;
(d) Sufficient food resources to support juvenile and adult foraging;
(e) Overwintering refugia, where thermal properties of the microhabitat protect hibernating life stages from winter freezing, such as crevices or holes within bedrock, in and near shore; and/or
(f) Streams, stream reaches, or wet meadow habitats that can function as corridors for movement between aquatic habitats used as breeding or foraging sites.

(3) Upland areas.
(a) Upland areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement by mountain yellow-legged frogs:
(i) For stream habitats, this area extends 82 feet from the bank or shoreline;
(ii) In areas that contain riparian habitat and upland vegetation (for example, mixed conifer, ponderosa pine, montane conifer, and montane riparian woodlands), the canopy overstory should be sufficiently thin (generally not to exceed 85 percent) to allow sunlight to reach the aquatic habitat and thereby provide basking areas for the species;

(iii) For areas between proximate (within 984 feet) of water bodies (typical of some high mountain lake habitats), the upland area extends from the bank or shoreline between such water bodies; and

(iv) Within mesic habitats such as lake and meadow systems, the entire area of physically contiguous or proximate habitat is suitable for dispersal and foraging.

(b) Upland areas (catchments) adjacent to and surrounding both breeding and nonbreeding aquatic habitat that provide for the natural hydrologic regime (water quantity) of aquatic habitats. These upland areas should also allow for the maintenance of sufficient water quality to provide for the various life stages of the frog and its prey base.

Critical Habitat Baseline for the Sierra Nevada Yellow-legged Frog and Northern Distinct Population Segment of the mountain yellow-legged frog

Critical Habitat Unit 1 represents the northernmost portion of the Sierra Nevada yellow-legged frog's range. There are four sub-units within Critical Habitat Unit 1, all of which occur within the boundaries of the Plumas National Forest (although critical habitat does cover relatively small private inholdings within the Plumas National Forest as well). The frog populations within critical habitat unit 1 are at very low numbers and face significant threats from habitat fragmentation (Service 2016). The presence of introduced fishes, water diversions and operations, inappropriate grazing activity, timber management and fuels reduction, and recreational activities may require special management considerations or protection (Service 2016).

Critical Habitat Unit 2 represents a significant fraction of the Sierra Nevada yellow-legged frog's range, and it reflects unique ecological features within the range by comprising populations that are both stream- and lake-based. There are 14 sub-units within critical habitat unit 2, which occur within the following National Forests: Lassen, Plumas, Tahoe, Eldorado, Stanislaus, Inyo, and the Lake Tahoe Basin Management Unit. Four of the sub-units occur within Yosemite National Park and are therefore not affected by Forest Service programs. Portions of sub-units 2F and 2H occur within the Humboldt-Toiyabe National Forest, which is not analyzed in this programmatic biological opinion. Sierra Nevada yellow-legged frog populations within Critical Habitat Unit 2 are at very low to intermediate abundance and face significant threats from habitat fragmentation resulting from the introduction of fish (Service 2016). The presence of introduced fishes, water diversions and operations, inappropriate grazing activity, timber management and fuels reduction, and recreational activities may require special management considerations or protection (Service 2016).

Critical Habitat Unit 3 represents a significant portion of the species' range, and it reflects a core conservation area comprising the most robust remaining populations at higher densities (closer proximity) across the species' range. The frog populations within Critical Habitat Unit 3 face significant threats from habitat fragmentation (Service 2016). The presence of introduced fishes, inappropriate grazing activity, and recreational activities may require special management considerations or protection (Service 2016).

Critical Habitat Baseline for the Northern Distinct Population Segment of the mountain yellow-legged frog

Critical Habitat Unit 4 represents a significant portion of the northern DPS of the mountain yellow-legged frog's range and reflects a core conservation area comprising the most robust remaining populations at higher densities (closer proximity) across the species' range. The Service (2016) determined that populations within this critical habitat unit face significant threats from habitat fragmentation and populations have low abundance numbers. This critical habitat unit includes the

only remaining basins with high-density, lake-based populations that are not infected with Bd, and Bd will likely invade these uninfected populations in the near future (Service 2016). Three of the four sub-units of Critical Habitat Unit 4 occur entirely within Sequoia/Kings Canyon National Parks. Only one unit (Unit 4a) covers Forest Service lands (a relatively small portion of Sequoia National Forest). Within Unit 4a, the presence of introduced fishes may require special management considerations or protection (Service 2016).

Critical Habitat Unit 5 represents the southern portion of the species' range and reflects unique ecological features within the range of the species because it comprises populations that are stream-based. The frog populations within Critical Habitat Unit 5 are at very low numbers and face significant threats from habitat fragmentation (Service 2016). The three sub-units within Critical Habitat Unit 5 occur within Sequoia and Inyo National Forests. Portions of sub-units 5a and 5b also occur within Sequoia National Park. The presence of introduced fishes, inappropriate grazing activity, and recreational activities may require special management considerations or protection (Service 2016).

Yosemite Toad

The Yosemite toad was listed as a threatened species on April 29, 2014, under the Endangered Species Act of 1973, as amended (U.S. Fish and Wildlife Service 2014).

The Yosemite toad was originally described as *Bufo canorus* by Camp (1916), who gave it the common name of Yosemite Park toad. Grinnell and Storer (1924) referred to it as the Yosemite toad when they found the species' range extended beyond the boundaries of Yosemite National Park.

Frost *et al.* (2006) divided the paraphyletic genus *Bufo* into three genera, assigning the North American toads, including the Yosemite toad, to the genus *Anaxyrus*. Feder (1977) found the Yosemite toads are the most genetically distinct member of the *boreas* group based on samples from a limited geographic range. However, it hybridizes with western toads in the northern part of their range (Blair 1972; Karlstrom 1962; Morton and Sokolski 1978). Shaffer *et al.* (2000) analysed a segment of mitochondrial DNA from 372 individuals collected in Yosemite National Park and Sequoia-Kings Canyon National Parks. They found there are significant genetic differences in Yosemite toads between the two National Parks. The genetic divergence in individuals from regionally proximate populations was high, implying low rates of genetic exchange.

Physical Description

The Yosemite toad is a moderately sized amphibian, with the adults ranging in size from 1.2 inches to 2.8 inches from the tip of their snout to their urostyle, a bony structure at the posterior end of the spinal column (Karlstrom 1962; Dodd 2013a; Lannoo 2005). A thin mid-dorsal stripe is present in juveniles of both sexes. The stripe disappears or is reduced with age; this process takes place more quickly in males (Dodd 2013a; Lannoo 2005). The iris of the eye is dark brown with gold iridophores (Dodd 2013a). The large paratoid glands are rounded to slightly oval in shape.

Male Yosemite toads are smaller than the females, and they have less conspicuous warts (Stebbins 1951, 2003; Stebbins and McGinnis 2012; Dodd 2013a; Green *et al.* 2014; Lannoo 2005). Differences in coloration between males and females are more pronounced in this species than in any other North American frog or toad (Stebbins 1951). Females have black spots or blotches edged with white or cream set against a grey, tan, or brown background color (Jennings and Hayes 1994). Males have a nearly uniform dorsal coloration of yellow-green to olive drab to darker greenish brown (Dodd 2013a; Green *et al.* 2014; Lanoo 2005).

Mr. Randy Moore

Current Range and Distribution

The Yosemite toad is restricted to the Sierra Nevada in California from the Blue Lakes region north of Ebbetts Pass in Alpine County to just south of Kaiser Pass in the Evolution Lake/Darwin Canyon area in Fresno County (Green *et al.* 2014; Dodd 2013a; Lannoo 2005; Stebbins and McGinnis 2012; Jennings and Hayes 1994; Liang *et al.* 2010; Liang and Stohlgren 2011). The species historically inhabits elevations ranging from 6,000 to 11,910 feet (Stebbins 2003; Stephens 2001).

Approximately 72 percent of the Yosemite toad's range occurs on lands managed by the Forest Service (Forest Service 2014); a significant portion, 57 percent, is located within wilderness areas. There are a number of records of extant populations in the California Natural Diversity Data Base (California Department of Fish and Wildlife 2014a, 2014b). There is suitable habitat for the Yosemite toad in 4 National Forests (Figure 3).

Habitat and Life History

Terrestrial habitats utilized by Yosemite toad adults vary, particularly by elevation, and include forests, meadows, shrublands, rock outcrops, and talus. Mid-elevation meadows occur in yellow pine (mixed conifer) and lower edges of lodgepole-red fir forests. Meadows above 7,500 feet generally occur in lodgepole–red fir, subalpine and alpine ecosystems (USFS 2001b). Higher subalpine and alpine areas tend to be more open than lower elevation regions. Yosemite toads inhabit wet meadow habitats and lake shores surrounded by lodgepole or whitebark pines (Camp 1916, 1917; Dodd 2013a; Stebbins and McGinnis 2012; Lannoo 2005; Wang 2012). The species is most often found in areas with thick meadow vegetation or patches of low willows (Dodd 2013a; Mullally 1953). Liang (2010) observed Yosemite toads most frequently associated with, in order of preference: wet meadows, alpine-dwarf scrub, red fir, water, lodgepole pine, and subalpine conifer habitats.

The Yosemite toad generally is associated with meadows because these are the areas used as breeding habitat. After breeding, adults move into the surrounding uplands. Yosemite toads emerge at snowmelt to breed, generally May-June depending on location and snowpack, and are active above ground for approximately four months each year, reentering overwinter sites in the fall when the weather becomes cold (Kagarise Sherman and Morton 1993, Karlstrom 1962). Upon emergence, males form breeding choruses (Kagarise Sherman 1980, Kagarise Sherman and Morton 1984) and breeding takes place over a short period of time ranging from a few days to 2-4 weeks (Brown *et al.* 2012; Kagarise Sherman 1980; Sadinski 2004). Males usually remain at breeding areas for 1-2 weeks whereas females usually spawn within 1-2 days (Kagarise Sherman and Morton 1984). Eggs hatch in about 4-15 days, depending on ambient water temperatures. Tadpoles metamorphose in an average of 48–63 days and do not overwinter (Kagarise Sherman 1980, Karlstrom 1962).

Yosemite toads are found at both large and small sites (Liang 2010), indicating that this species is capable of successfully utilizing small habitat patches. Liang (2010) found that population persistence was greater at higher elevations, with an affinity for relatively flat sites with a southwesterly aspect. These areas receive higher solar radiation and are capable of sustaining hydric, seasonally ponded, and mesic breeding and rearing habitat. The Yosemite toad is more common in areas with less variation in mean annual temperature, or more temperate sites with less climate variation (Liang 2010).

The Yosemite toad is a late maturing, long-lived species. Females first breed when they are 4-6 years old and males at 3-5 years of age (Kagarise Sherman 1980). Estimates of apparent annual survival of adult males in six meadows ranged from 50 percent to 72 percent (Brown *et al.* 2012). Some females

may live as long as 15 years and males up to 12 years (Kagarise Sherman and Morton 1984). Periodic years of high recruitment and high survival rates of adults maybe important for the long-term persistence of populations (Biek *et al.* 2002; Brown *et al.* 2012).

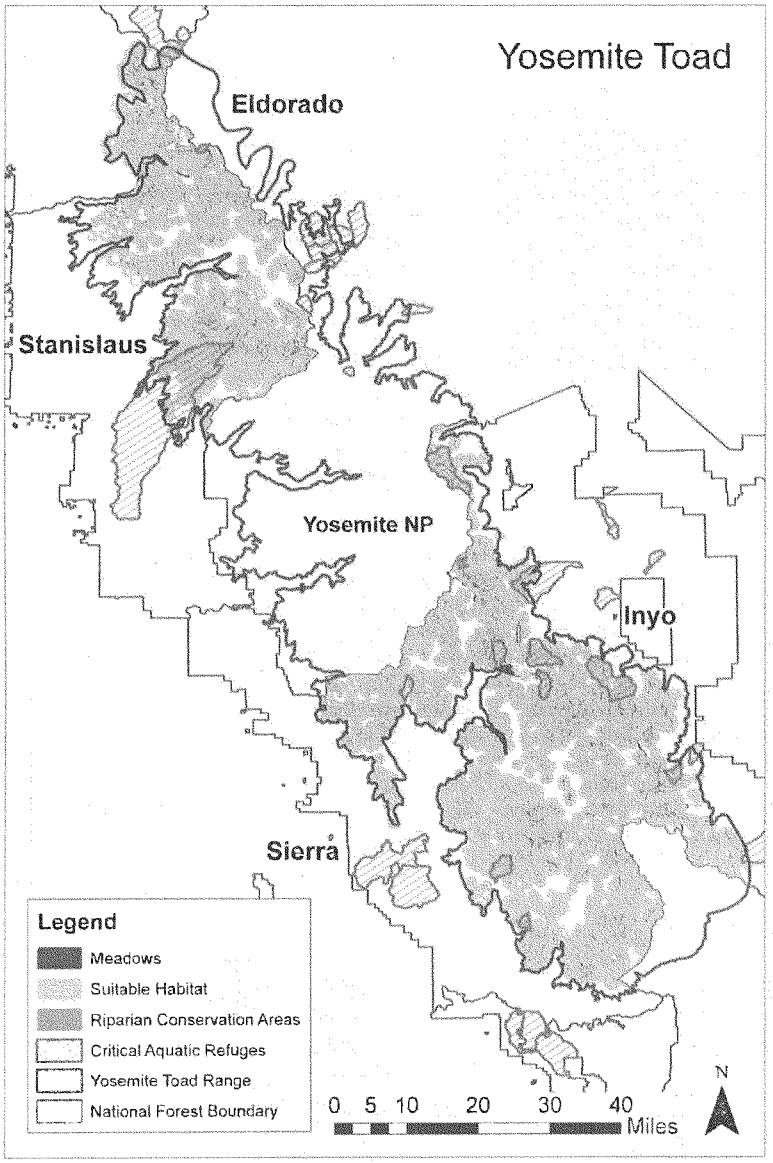
Yosemite toads likely are more nocturnally active than has previously been reported. They breed during the day, but a recent study found them to be equally active at night (Brown *et al.* 2009). Martin (2008) and Liang (2010) observed movement of adults both during the day and night, and they speculated that long distance movements occur during the hours of darkness.

The breeding habitat of the Yosemite toad include very shallow waters, most commonly in wet meadows, but also in lake edges, and slow-moving streams and sloughs (Kagarise Sherman 1980; Karlstrom and Livezey 1955; Karlstrom 1962; Martin 2008; Mullally 1953). On the Sierra National Forest, Liang (2010) observed breeding in both large and small meadows, indicating that this species is capable of successfully utilizing small habitat patches. Liang (2010) found breeding site occupancy was greater in seasonal waters in relatively flat sites facing a southwesterly direction with warmer water temperatures. Breeding sites were associated with higher elevations, less variable air temperatures, more precipitation in the warmest three months of the year, and less precipitation during the driest three months. Liang (2010) also noted that the species' distribution was related to a number of different factors rather than a small set of variables. In Yosemite National Park, Knapp (2005a) found high elevation and meadow shorelines were significantly correlated with occurrence. Roche *et al.* (2012a) found annual occupancy to be positively correlated with annual precipitation.

In the late winter or early spring, male Yosemite toads exit their upland burrows before the females, and they spend more time in the breeding pools (Kagarise Sherman and Morton 1993). Most adult males appear to breed annually, whereas females may skip years between breeding (Kagarise Sherman 1980; Morton 1981; Brown *et al.* 2012). Females have high lipid storage levels, and there may be a trade-off between its use to enhance overwinter survival and the energetic expense of breeding every year (Morton 1981). The Yosemite toad is a prolific breeder that lays many eggs immediately at snowmelt over a short period of time. The reproductive output of the females is relatively high with estimates that some individuals may lay from 1,100 to 2,000 eggs in a single season (Kagarise Sherman 1980; Karlstrom and Livezey 1955; Karlstrom 1962). Females may split their egg clutches within the same pool, or even between different pools, and eggs may be communally laid with other toads (USFS *et al.* 2009). Mortality of eggs and tadpoles caused by freezing or desiccation may be high in some years leading to low or no recruitment (Brown *et al.* 2012; Kagarise Sherman 1980; Sadinski 2004).

Mr. Randy Moore

Figure 3. Yosemite Toad Suitable Habitat Range Map



Mr. Randy Moore

The characteristics of Yosemite toad breeding sites generally are associated with warm environments conducive to rapid development (Kagarise Sherman and Morton 1984; Karlstrom 1962). This includes hydroperiods of sufficient length for successful metamorphosis. The female Yosemite toads generally lay their eggs in very shallow, warm, and often ephemeral water at the edges of small pools or in flooded meadow vegetation, most commonly with no or low flow (Kagarise Sherman 1980; Mullally 1953; Sadinski 2004). The tadpoles are most commonly observed in shallow warmer water, and the will move from cooler to warmer locations within a breeding site (Mullally 1953; Karlstrom 1962; Kagarise Sherman and Morton 1984). The eggs are laid at depths ranging from 1.5 inches to 3 inches with a median depth of about 2.5 inches (Sadinski 2004; Kagarise Sherman 1980; Karlstrom 1962; Roche *et al.* 2012a).

After the breeding period, adults Yosemite toads disperse into meadows, ephemeral streams, seeps and springs, and uplands (Liang 2010; Martin 2008). One telemetry study on the Stanislaus National Forest found that they moved a maximum distance of 2,156 feet (Martin 2008), another study recorded an individual had moved 4,137 feet in the Sierra National Forest (Liang 2010), and Morton and Pereyra (2010) found animals 2,789 feet away from their breeding pools. Females are recorded to move further than males. In the telemetry study on the Sierra National Forest, the maximum distance travelled by females was 4,137 feet versus 2,838 feet by males, and the average distance travelled by females was twice that of males (Liang 2010). At Tioga Pass Meadows, 64 percent of females were in the furthest zone, 2,789 feet from the breeding pools, compared with only 4 percent of males. In contrast, 54 percent of males were found in the breeding meadows, compared with 19 percent of females (Morton and Pereyra 2010). Liang (2010) found that most long-distance travel was undertaken in the first 60 days after the breeding period, and individuals often stayed in the same location for several days or weeks. Adult females utilized different habitat than adult males during the non-breeding season (Morton and Pereyra 2010). Morton and Pereyra (2010) found that during late July and August, over 60 percent of Yosemite toads in upland rocky hillside habitat were adult females and less than 10 percent were adult males. In lowland meadow habitat near a breeding pond, 54 percent of the individuals were adult males and about 19 percent were adult females.

Overwintering habitat of the Yosemite toad may include rodent burrows, crevices under rocks and stumps, and root tangles at the base of willows (Davidson and Fellers 2005, Kagarise Sherman 1980, Martin 2008). Some metamorphs appear to overwinter their first year in the terrestrial meadow habitat adjacent to their rearing site and move to more distant terrestrial habitat during mid-summer of their second year (Kagarise Sherman and Morton 1993; Morton and Pereyra 2010).

Individual Yosemite toads show fidelity to breeding meadows and adult habitats (Brown *et al.* 2012; Kagarise Sherman and Morton 1984; Liang 2010). In Tioga Pass Meadows, most of the males and females returned to the same breeding sites (Kagarise Sherman and Morton 1984). During four years of a mark-recapture study, only three of 37 males moved to different meadows to breed, though males did move among breeding areas within meadows (Brown *et al.* 2012). In one radio telemetry study, individuals used the same upland nonbreeding areas and sometimes the same exact site for multiple years (Liang 2010).

Status and Threats

The Yosemite toad is imperiled by a variety of factors, especially damage or loss of habitat, global climate change, and chytrid fungus (Lannoo 2005; Martin 2008; Green *et al.* 2014 Davidson and Fellers 2005; Brown *et al.* 2011). The exact number of the remaining populations of the Yosemite toad is unknown, but the number of known occupied sites such as lakes, ponds, and meadows, streams is estimated to be around 740.

Mr. Randy Moore

The only long-term, site-specific population study of the Yosemite toads found a dramatic decline over 2 decades of monitoring. Kagarise Sherman and Morton (1993) studied the species at Tioga Pass Meadow from 1971 through 1991, with the most intensive monitoring between the years 1971 to 1982. A decline in the average number of males entering the breeding pools declined from 258 to 28 during the mid-1970s through 1982. During the same time period, the number of females varied between 45 and 100, but there was no apparent trend in number observed. During the 1980s, both males and females continued to decline, and breeding activity became sporadic. By 1991, only one male and two egg masses was found by Kagarise Sherman and Morton (1993). A similar population decline was recorded in local nonbreeding habitat.

High meadow habitat quality in the western United States, and specifically the Sierra Nevada, has been degraded by various stressors over the last century (Vale 1987; Ratliff 1985). These various stressors have contributed to erosion and stream incision, leading to meadow dewatering and encroachment by invasive vegetation (Menke *et al.* 1996). The legacy of these impacts remains extant to this day in the ecosystems of the high Sierra Nevada (Vankat and Major 1978). Given the reliance of the Yosemite toad on these high meadow habitats for breeding, and early life history stage and adult survival, the various stressors likely have had an effect on the viability of their populations via the degradation of their habitat.

Since high meadows in the Sierra Nevada are dependent on their hydrologic setting, most meadow degradation is due fundamentally to hydrologic alterations. Montane meadows have been identified among the most vulnerable and impacted habitat types of the Sierra Nevada (Kattelmann and Embury 1996, U.S.Forest Service 2004). While impacts have varied depending on meadow hydrogeomorphic type (Weixelman *et al.* 2011), drying on meadow systems associated with streams where downcutting has occurred is one of the most significant forms of change that has occurred, primarily as a result of livestock overgrazing (Wagoner 1886; Ratliff 1985; Menke *et al.* 1996). Roads and historic logging practices have resulted in meadow degradation in the form of drying, stream incision and creation of headcuts (Biological Assessment).

Livestock grazing was historically widespread in the Sierra Nevada and historically caused widespread degradation of meadows (Menke *et al.* 1996), such as those utilized by the Yosemite toad for breeding. Studies investigating the effects of livestock grazing on amphibians have found positive, negative, and no associations, though most were not conducted in alpine meadows (Adams *et al.* 2009; Bull and Hayes 2000; Burton *et al.* 2009; Ford *et al.* 2013; Jansen and Healey 2003; Knutsen *et al.* 2004; Roche *et al.* 2012a; Lind *et al.* 2011; McIlroy *et al.* 2013).

Until recently, the effect of chytrid to Yosemite toad population declines was relatively unknown. Although the animal is hypothetically susceptible due to their co-occurrence with the Northern Distinct Population Segment of the mountain yellow-legged frog and Sierra Nevada yellow-legged frog, the spread and growth of chytrid in the warmer pool habitats, occupied for a much shorter time relative to the frogs may render individuals less prone to epidemic outbreaks (Green and Kagarise, Sherman 2001; USFS *et al.* 2009). Fellers *et al.* (2007) documented the occurrence of chytrid infection of Yosemite toad in Yosemite National Park over at least a couple of decades, and populations of the animal persisted in spite of the continued presence of the pathogen. In a survey of 196 museum specimens, Dodge and Vredenburg (2012) reported the first presence of Bd infection in Yosemite toads beginning in 1961, with the pathogen becoming highly prevalent during the recorded declines of the late 1970s, before it peaked in the 1990s at 85 percent positive incidence. Dodge and Vrendenburg (2012) collected 1,266 swabs from live Yosemite toads between 2006 and 2011, and they found Bd infection intensities at 17–26 percent, with juvenile toads most affected. The results from these studies support the hypothesis that chytrid have played an

important role in Yosemite toad population dynamics over the period of their recent recorded decline.

Fire likely plays a significant role in the evolution and maintenance of meadows utilised by the Yosemite toad in the Sierra Nevada. Under natural conditions, conifers are excluded from meadows by fire and saturated soils. Small fires thin and/or destroy encroaching conifers, while large fires are believed to determine the meadow-forest boundary (Vankat and Major 1978). Fire is thought to be important in maintaining open aquatic and riparian habitats for amphibians in some systems, and fire suppression may have thereby contributed to conifer encroachment on meadows (U.S. National Park Service 2010).

Trampling and collapse of rodent burrows by hikers, livestock, pack animals, pets, or vehicles may have led to direct injury or death of the Yosemite toad. Recreational activity also may harass individuals and disrupt their behavior (Karlstrom 1962). Recreational anglers may be the transport mechanism of introduced pathogens and parasites, and they have been observed using toads and tadpoles as bait (USFS *et al.* 2009). However, Kagarise Sherman and Morton (1993) did not find a relationship between the distance from the nearest road and the declines in Yosemite toad populations, suggesting that human activity was not the cause of decline.

Small and isolated populations are vulnerable to stochastic events that can lead to their decline and extirpation (Shaffer 1981). For example, small populations are more likely to be devastated by adverse environmental factors than large populations. Small populations also have increased chance of genetic drift and inbreeding that can lead to losses in genetic variation (Service 2014). A high degree of site fidelity also can increase the vulnerability of small populations if Yosemite toads continue to return to habitats that are no longer suitable due to, for example, meadow degradation or climate change. Finally, some management activities may not adversely affect Yosemite toad populations across their range, but potentially may have significant effects on specific populations. Losses of even a few populations may be important in a declining species, such as this animal.

Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (California Climate Action Team 2006; U.S. Global Change Research Program 2013). As global temperatures continues to rise, habitats are moving northward and upward in elevation, others will be eliminated, but in the near future, range contractions or extinctions of some species are more likely than simple northward or upslope shifts and this may be especially pronounced for Sierra amphibians owing to habitat fragmentation and the relative lower dispersal ability of these species. The Yosemite toad has a short active season and it requires very shallow ephemeral water for reproduction (Kagarise Sherman and Morton 1984). The amount of water in the breeding ponds is dependent on the amount and timing of the spring snowpack. As snow melts in the spring, meadow breeding areas flood and pools fill with water, and then dry out during the course of the summer. Rapid desiccation of breeding sites can lead to low or no recruitment of the Yosemite toad (Kagarise Sherman 1980). Reductions in snowpack may result in less available surface water, fewer pools for Yosemite toad reproduction and development of early life history stages (Adger et al. 2007; McMenamin et al. 2008). Low snowpack's also may contribute to increased conifer encroachment of meadow habitat (Service 2014). Rising temperatures and early snowmelt may influence the Yosemite toad's behavior, the timing of reproduction and other phenological events, the duration of tadpole development, and resulting effects on survivorship (Blaustein et al. 2010; Walls et al. 2013). Global Climate Change is highly likely to adversely influence ground water transport, reduced persistence of surface water that leads to lower water levels available for eggs, tadpoles, breeding, and other life history stages of the Yosemite toad. Therefore, ongoing Global Climate Change is highly likely to imperil these three listed species and the resources, including the aquatic areas, necessary for their survival, as climate change effects become more pronounced.

The Yosemite toad occurs within the action area as demonstrated by: (1) recent observations of the species on Forest Service lands in the Sierra Nevada; (2) the biology and ecology of the animal, especially the ability of individuals to move, forage, and winter in uplands; and (3) the action area contains physical features that provide refuge, breeding, foraging, and dispersal habitat for the amphibian.

Status of Critical Habitat for the Yosemite Toad

Approximately 750,926 acres of critical habitat have been designated for the Yosemite toad in Alpine, Tuolumne, Mono, Mariposa, Madera, Fresno, and Inyo Counties, California (Service 2016). Critical habitat was divided into 16 separate units. The critical habitat units constitute the Service's current best assessment of areas that meet the definition of critical habitat for the Yosemite toad. The 16 units were known to be occupied when critical habitat was designated and the Service assumes these sub-units are currently occupied. Of the 750,926 acres, approximately 516,756 acres occur on Forest Service lands covered under this programmatic biological opinion. Yosemite toad critical habitat occurs on the following national forests: Eldorado, Stanislaus, Sierra, and Inyo.

The Service (2016) determined that the Yosemite toad requires the following physical or biological features: (1) space for individual and population growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing (or development) of offspring; and (5) habitats protected from disturbance or representative of the historical, geographic, and ecological distributions of the species.

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, the Service (2016) determined that the primary constituent elements specific to the Yosemite toad are:

(1) Aquatic breeding habitat.

- (a) This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes, that:
  - (i) Are typically (or become) inundated during snowmelt;
  - (ii) Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and
  - (iii) Contain sufficient food for tadpole development.
- (b) During periods of drought or less than average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years.

(2) Upland areas.

- (a) This habitat consists of areas adjacent to or surrounding breeding habitat up to a distance of 0.78 miles in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and areas that provide:
  - (i) Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia,
  - (ii) Foraging habitat,
  - (iii) Adequate prey resources,
  - (iv) Physical structure for predator avoidance,
  - (v) Overwintering refugia for juvenile and adult Yosemite toads,
  - (vi) Dispersal corridors between aquatic breeding habitats,
  - (vii) Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat, and/or
  - (viii) The natural hydrologic regime of aquatic habitats (the catchment).

(b) These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base.

With the designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of species through the identification of the appropriate quantity and spatial arrangement of the PCEs that are sufficient to support the life-history functions of the species. Because not all life-history functions require all of the PCEs, not all areas designated as critical habitat will contain all of the PCEs.

Critical Habitat Baseline for the Yosemite Toad

Unit 1 represents the northernmost portion of the Yosemite toad's range and occurs within Eldorado, Humboldt-Toiyabe, and Stanislaus National Forests, as well as a smaller amount of private lands. The presence of inappropriate grazing and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change.

Unit 2 occurs predominantly within the Stanislaus and Humboldt-Toiyabe National Forests, and Yosemite National Park. This unit is considered essential to the conservation of the species because it contains a high concentration of Yosemite toad breeding locations and represents a variety of habitat types utilized by the species. Unit 2 provides continuity of habitat between adjacent units, as well as providing for a variety of habitat types necessary to sustain Yosemite toad populations under a variety of climate regimes (Service 2016). The presence of inappropriate grazing and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 3 occurs within the Humboldt-Toiyabe National Forest and Yosemite National Park. No Forest Service programs analyzed in this programmatic biological opinion occur within these areas and therefore will not affect this critical habitat unit.

Unit 4 occurs within the Inyo and Humboldt-Toiyabe National Forests and Yosemite National Park. This unit contains Yosemite toad populations with a high degree of genetic variability east of the Sierra crest within the central portion of the species' range. Unit 4 is an essential component of the entirety of this critical habitat designation because it provides a continuity of habitat between adjacent units, provides for the maintenance of genetic variation, and provides habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 5 is predominantly within the Inyo National Forest and Yosemite National Park. This unit contains a high concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, has high genetic variability, and, due to the long-term occupancy of this unit, is considered an essential locality for Yosemite toad populations. This unit is an essential component of the entirety of this critical habitat designation because it provides continuity of habitat between adjacent units, as well as providing for a variety of habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Units 6, 7, and 8 occur entirely within Yosemite National Park. Forest Service programs will not occur within these critical habitat units.

Unit 9 occurs within the Sierra National Forest and Yosemite National Park. This unit contains a high concentration of Yosemite toad breeding locations and represents a variety of habitat types utilized by the species (Service 2016). The unit also provides continuity of habitat between adjacent units, specifically east-west connectivity, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 10 occurs entirely within Yosemite National Park. Forest Service programs will not occur within this critical habitat unit.

Unit 11 occurs within the Sierra National Forest and Yosemite National Park. This unit contains a high concentration of Yosemite toad breeding locations and represents a variety of habitat types utilized by the species. Further, this unit contains the southernmost habitat within the central portion of the range of the Yosemite toad. The unit provides continuity of habitat between adjacent units, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes (Service 2016). The presence of grazing, timber harvest and fuels reduction, and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 12 occurs within the Inyo and Sierra National Forests. This unit contains a high concentration of Yosemite toad breeding locations and represents a variety of habitat types utilized by the species. The unit provides continuity of habitat between adjacent units, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of grazing and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 13 occurs within the Inyo and Sierra National Forests. This unit contains a high concentration of Yosemite toad breeding locations and represents a variety of habitat types utilized by the species. The unit provides continuity of habitat between adjacent units, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 14 occurs primarily within the Sierra National Forest. This unit contains a high concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, and is located at the southwestern extent of the Yosemite toad range. This unit provides continuity of habitat between adjacent units, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes (Service 2016). The presence of grazing, timber harvest and fuels reduction, and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Unit 15 occurs within the Sierra National Forest and Kings Canyon National Park. This unit contains a high concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, and is located at the easternmost extent within the southern portion of the Yosemite toad's range. The unit provides continuity of habitat between adjacent units, as well as habitat types necessary to sustain Yosemite toad populations under various climate regimes. The Service (2016) stated that known threats included disease, predation, and climate change. This area requires special protection because of its value as occupied habitat that provides geographic

connectivity to allow for Yosemite toad metapopulation persistence and resilience across the landscape to changing climate (Service 2016).

Unit 16 occurs primarily within the Sierra National Forest. This unit contains a high concentration of Yosemite toad breeding locations, represents a variety of habitat types utilized by the species, and encompasses the southernmost portion of the range of the species. The unit provides continuity of habitat between adjacent units, represents the southernmost portion of the range, and provides habitat types necessary to sustain Yosemite toad populations under various climate regimes. The presence of inappropriate grazing and recreational activities may require special management considerations or protection (Service 2016). This unit also has threats due to disease, predation, and climate change (Service 2016).

Effects of the Proposed Action

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Pre-activity surveys conducted for the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment, Yosemite toad, and suitable habitat likely would reduce adverse effects resulting from projects in the nine Forest programs. The appropriate minimization measures will be implemented if individuals or suitable habitat are found. In addition, various BMPs and S&Gs as described in the Conservation Measures will also be implemented that will minimize the effects to the three listed amphibians. In addition, the Monitoring Program has been developed by the Forest Service in conjunction with the Service to evaluate compliance and implementation, take and the effectiveness of the conservation measures. This Program will ensure compliance as well as provide information on the effectiveness of these measures.

The nine Forest programs consist of a wide variety of activities that will adversely affect the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, Yosemite toad, and their habitats. The activities in the nine Forest programs will adversely affect the three listed amphibians in the following ways:

1. Vegetation Management, Timber Harvest, Fuels Management and Watershed Restoration

The potential effects from this Forest program include harm, harassment, capture, injury, and death of egg masses, tadpoles, subadults, and adults of the three listed amphibians. Individuals can be displaced, crushed, injured, or killed by earthmoving, yarding, skidding, construction of temporary roads, skid trails and landings; activities associated with falling trees, piling or burning; directly injuring or killing individuals; or trapping, injuring and killing individuals in burrows. The use of plastic netting and similar materials for erosion control could result in the entanglement and death of Yosemite toad and Sierra Nevada yellow-legged frog due to exposure, starvation, strangulation, or predation (Stuart *et al.* 2001). Prescribed fire activities could result in direct mortality from burning or crushing. Individuals using downed wood for cover may be killed, injured or disturbed during treatments for removal, piling, or burning.

Vegetation management activities may cause noise, vibration, dust, and other disturbances to the three listed amphibians that result in their avoidance or abandonment of locations containing breeding, resting, movement, or foraging habitat.

According to studies cited in the BA, direct fire related mortality of adult amphibians is rare, either because of the timing of the fire or because individuals are able to take refuge from fire in burrows, moist ground, or water sources such as ponds (USFS 2013a). The immediate effects of wildfire in the form of mortality of individuals and failed reproduction, is expected to be a small threat to most healthy populations, unless stressors such as drought or persistent habitat change have left populations isolated or with an extremely limited distribution (USFS 2013a). The Boreal toad, a species closely related to the Yosemite toad, showed a positive response to fire events in western Montana (Hossack and Pilliod 2011; Bartelt 1998), colonizing recently burned wetlands and using severely burned forests more than moderately burned forests. The more severely burned areas had warmer surface and burrow temperatures even 3 years after the fire event (Hossack *et al.* 2009). Hossack *et al.* (2012) found a time-lagged decline in occupancy of the highly aquatic Columbia spotted frog associated with wildfire. Boreal toad occupancy tripled in the three years following wildfires and then returned to pre-fire levels. In the Pacific Northwest, prescribed fire may increase the mortality of terrestrial amphibians by fire because prescribed burning usually occurs in fall to spring when amphibians are active (Bury 2004).

The three listed amphibians likely will be adversely affected by ground disturbing activities that include end-lining, skidding, dozer piling, mechanical equipment use such as road maintenance, skid trail construction, timber cutting, log prep, skidding, loading, and landing creation and general ground related access to cutting trees with mechanical equipment or conventional logging. Potential effects from activities associated with vegetation management include disturbance and destruction of breeding, basking, refuge, and overwintering sites. Potential habitat alterations include changes to canopy and other vegetative and non-vegetative cover, air and water microclimates including temperature, water quantity and quality, hydro periods, increased nutrients, sedimentation, woody debris, and channel scour.

The Yosemite toad likely is likely more vulnerable to the effects of vegetation management than the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frog. The toad occurs in upland habitat outside of meadow habitat for much of the summer, in contrast to the mountain yellow-legged frog that tends to remain near water. The Yosemite toad also is slow moving and unable to quickly get out of the way of logging equipment, people, or other sources of direct danger.

Fuels and other toxic materials such as oil will be required to operate the machines and equipment utilized for vegetation management, timber harvest, fuels management, and watershed restoration. Yosemite toads may potentially be exposed to these toxic materials in their terrestrial environments if vehicles leak these substances into habitat occupied by the toad.

The reduction of canopy cover may benefit the three listed amphibians by increasing the amount of available warm water and basking sites or may adversely affect them if temperatures increase higher than their thermal tolerances or if cover is not available. The importance of canopy cover may vary among streams, lakes, meadows, and other suitable habitats. Liang (2010) found adults associated with forest clearings. Currently, it is not known if a reduction in forest canopy cover in upland habitat is beneficial or detrimental to Yosemite toad. The burrows, logs, tree roots, and stumps used for cover and refuge by the toad may be adversely affected by road reconstruction, temporary and skid trail construction and use, and fire line construction. Adults have been found to have site fidelity to burrows (Liang 2010).

Ground-disturbing activities and changes in vegetation can affect soil stability, erosion, and sediment loading to aquatic habitats. Sedimentation can result from disturbance of stream banks, activities in upland areas, or activities in upstream seasonal drainages. Exposed, unprotected soil has the

potential to erode into aquatic systems, particularly with the season's first significant rain or during overland flows following snowmelt. One study found reduced amphibian densities in streams following road construction (Brown *et al.* 2014), and other studies have demonstrated impacts to fish, macroinvertebrates, and periphyton (Power 1990; Newcombe and MacDonald 1991; Brown *et al.* 2014). Sedimentation can affect all life history stages of the three listed amphibians by altering their habitat (Brown *et al.* 2014). High levels of sediment may fill deep pools used by mountain yellow-legged frogs, and the shallow pools in meadows used by Yosemite toads, alter primary productivity, fill interstitial spaces in stream and lake bed materials with fine particulates, change flow characteristics, reduce dissolved oxygen, and restrict waste removal (Chapman 1988). Embedded substrate potentially reduces the amount and quality of refugia. Conversely, increased amounts of silt substrate and detritus also may provide cover for tadpoles and post-metamorphic life stages. According to the BA, prescribed fires are expected to be short lived and fire intensity should be low enough to allow some retention of duff layers and riparian vegetation that will prevent soil erosion and expedite recovery

The three listed amphibians may be affected by activities in this Forest program that result in any change to the hydrology of their aquatic habitats. A decrease or elimination of the amount and duration of shallow surface water in meadows could affect breeding by the Yosemite toads; or the decrease or elimination in perennial water utilized by the mountain yellow-legged frog. Prescribed fire and mechanical vegetation removal may benefit the Yosemite toad by removing encroaching conifers which may increase water availability in the meadows with suitable or occupied habitat. Fuels and vegetation management may benefit the toad through the reduction of high intensity wildfire and its effects on hydrology and stream sediment.

The S&Gs and BMPs, when properly implemented, and coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Timber Harvest, Vegetation Management, and Watershed Restoration Program through restrictions in the timing or use of equipment; size and shape of harvest units; emergency response plans for chemical spills; enhancement of native vegetation; stream restoration, and other activities described in the conservation measures of this programmatic biological opinion. Forest Service projects are generally designed to avoid riparian habitat and aquatic features to protect water quality and reduce long-term degradation of these habitats.

2. Road and Trail Maintenance

Several characteristics of the three listed amphibians make them vulnerable to effects from roads and trail maintenance. First, these animals move among multiple habitats during their active season which may require crossing roads and trails; second, they move slowly and thus cannot easily avoid maintenance vehicles or equipment; third, they are relatively small and hard to see which makes them difficult to avoid; and fourth, they have permeable skin which may make them more susceptible to the toxic effects of chemicals from vehicles or used for road maintenance (Andrews *et al.* 2008). Potential adverse effects from motorized and non-motorized road and trail maintenance near or within occupied or suitable habitat include harassment, injury and death of the animals.

Drafting of water for road and trail maintenance may result in adverse effects to aquatic habitat. In-stream water drafting can substantially affect water flow or configuration of the bed, bank, or channel of streams that results in rapid changes or sustained reductions in flow, reduced dissolved oxygen, and/or increased water temperatures which could affect the three listed amphibians. In addition to direct hydro-geomorphic impacts to the mountain yellow-legged frog, water-quality impacts can occur as a result of road approaches that access the water drafting site. Many water drafting sites have steep approaches and in the absence of adequate drainage or surfacing, these

approaches can become chronic sources of sediment and runoff to the channel. Vehicles can leak oil, and sometimes fuel, onto drafting pads, becoming a source of petroleum product contamination to surface waters.

Chemical pollutants leaking or spilling from road maintenance may affect the three listed amphibians. Vehicle emissions, oil and gas leaks or spills, road degradation by-products, and chemicals used during road and trail maintenance can enter occupied or suitable habitat. The adverse effects of these pollutants to amphibians include reduced survival, growth, and metamorphosis, altered physiology and behaviors, deformities in tadpole oral cavities, and elevated levels of stress hormones (Mahaney 1994; Lefcort *et al.* 1997; Brown *et al.* 2009, Brown *et al.* 2014; Andrews *et al.* 2008; Beebee 2013).

Road and trail maintenance may result in increased sedimentation levels. Higher levels of sedimentation in aquatic habitat utilized by the three listed amphibians (Brown *et al.* 2009; Brown *et al.* 2014) likely will result in adverse effects to these animals.

When the S&Gs and BMPs are properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Road and Trail Maintenance Program through water quality monitoring and protection; minimization of erosion; and other activities described in the conservation measures of this programmatic biological opinion.

3. Maintenance of Developed Recreation and Forest Service Infrastructure

The routine maintenance of existing Forest Service facilities is not likely to cause further loss of suitable and occupied habitat but may affect cover, hydrology, water quality, and sedimentation in surrounding areas, or result in the displacement, injury, and death of the three listed amphibians. Maintenance of developed recreation and infrastructure sites that require earth moving or soil disturbance may cause erosion that can increase siltation and sedimentation. Sedimentation can alter the morphology of habitats, such as filling in pools in streams and creeks, and reduce cover by filling interstitial spaces in stream, creek, and lake substrates. The clearing of vegetation as part of routine maintenance may affect adult Yosemite toads if they use facility surroundings. Equipment and human activity associated with vegetation clearing and other routine maintenance also may destroy or alter cover components such as burrows, logs, tree roots, or stumps. These activities may result in a decrease in vegetative cover along stream and lake shores and in meadows and dislodge rocks, wood and other cover utilized by the three listed amphibians. Rodent burrows, rocks logs, or tree stumps used by the Yosemite toad as refugia may be crushed, moved, or altered.

The maintenance of facilities may affect the availability and quality of water in suitable or occupied habitats. For example, water may be diverted or used for purposes such as drinking water. Water storage facilities may serve as habitat for invasive species such as bullfrogs or crayfish. Water quality may be affected by Special Use Permit activities associated with existing infrastructures such as campgrounds, work centers, and ski areas.

Numerous conservation measures that protect riparian vegetation, wetlands and other aquatic features will minimize the adverse effects to the three listed amphibian species. The S&Gs and BMPs, when properly implemented, and coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Developed Recreation and Administrative Infrastructure Program through protection of water quality, including stream flows, and the hydrology of wetlands and meadows, as described in the conservation measures of this programmatic biological opinion.

Mr. Randy Moore

4. Special Use Permits

Special Use Permits are issued for a wide array of activities from single occurrence recreation events to construction and maintenance of permanent structures such as maintenance yards, storage facilities, or recreation camps. Many activities requiring special use permits that occur in or near occupied or suitable habitat have the potential to displace, injure, or kill one or more of the three listed amphibians. Temporary uses such as special events may result in short-term trampling and destruction of vegetation, burrows, and other cover components, which could result in displacement, injury, or death of the listed amphibians. Other special use activities such as clearing of vegetation for routine maintenance of infrastructures including right of ways and transmission lines may result in permanent loss of suitable or occupied habitat.

Some activities authorized by Special Use Permit may alter cover, hydrology, water quality, and result in sedimentation. Special uses involving water developments such as dams, diversions, and impoundments can change aquatic habitats. Flooding of meadow and stream habitats can eliminate Yosemite toad and mountain yellow-legged frog breeding habitats. Creation of ponds and lakes can be beneficial for mountain yellow-legged frogs if these habitats are properly designed and constructed, not stocked with fish, or invaded by other non-native species.

Water may be diverted under Special Use Permits for a number of purposes including hydroelectric generation, drinking water, or water storage. Water diversions can adversely affect the three listed amphibians if they remove water from occupied or suitable habitats or shorten the length of time surface water is present. Alteration in the amount and duration of surface water habitat can lead to reduction or failure of successful breeding. The Yosemite toad breeds in very shallow water, and its eggs and tadpoles desiccate and die when water dries up (Kagarise Sherman and Morton 1984; Brown *et al.* 2012). Mountain yellow-legged frogs require permanent water for their multi-year tadpole stage, and multiple year classes may be lost if breeding sites dry out (Lacan *et al.* 2008). Artificially low water levels in a pond or lake going into winter can lead to freezing of the entire water body or reduced oxygen levels, resulting in increased mountain yellow-legged frog mortality (Bradford 1983). Artificial changes in water flows and velocities in creeks or streams during breeding, egg laying, and development can result in injury and mortality to individuals of the two listed frogs.

Water quality may be affected by activities authorized under Special Use permits, such as campgrounds, camps, visitor centers, ski areas, roads and other paved surfaces, and other facilities requiring maintenance that are located near water including transmission towers and rights of way. The construction or maintenance of roads, parking lots, and other paved or compacted surfaces may lead to diverted or increased runoff that alters hydrology. This may ultimately affect water availability and duration in nearby aquatic areas that provide occupied or suitable habitat. Recreation-related activities such as swimming and washing may introduce pollutants such as sunscreen and insect repellent into aquatic habitats. Pollution may result from sanitation facilities, water runoff from roads and parking lots, oil and other toxic residue from maintenance equipment, snowmelt runoff from ski areas, and the use of pesticides.

Various activities covered by Special Use Permits may contribute to increased sedimentation in nearby aquatic habitat. Some amount of soil erosion may enter streams with activities that occur within riparian areas. Sediment also may enter waterways from actions requiring ground-disturbing machinery. Sedimentation can alter the morphology of habitats such as by filling in pools in streams, and reduce cover by filling interstitial spaces in stream and lake substrates.

The S&Gs and BMPs properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Special Use Permit Program through protection of water quality, including stream flows, and the hydrology of wetlands, fens, and meadows, as described in the conservation measures of this programmatic biological opinion.

5. Rangeland Management

Livestock grazing occurs in riparian and meadow ecosystems on National Forests lands in the Sierra Nevada. Riparian and meadow systems are the key livestock forage areas within allotments above 4,000-foot elevations. Ranchers move livestock to these higher elevation areas during the summer and early fall when the lower elevation ranges dry out (USFS 2001b). Currently, grazing occurs on about 65 percent of the land within 9 Forests (USFS 2001b, 2003; Belsky *et al.* 1999). Sheep grazing only occurs on the Inyo, Plumas, and Tahoe National Forests.

In the Sierra Nevada, several studies have examined associations between livestock grazing and the Yosemite toad (McIlroy *et al.* 2013; Roche *et al.* 2012a, 2012b), and no studies have been conducted for the mountain yellow-legged frog. In their 4 -5 year study from 2006 to 2010, comparing three grazing treatments, 1) utilization at current standards (40 percent), 2) fencing the whole meadow, and 3) fencing breeding areas, McIlroy *et al.* (2013) found no significant detectable differences of the grazing treatments on proportion of occupied Yosemite toad breeding pools, tadpole density, and young of the year density in breeding habitats. Similarly, Roche *et al.* (2012b) found that between 2006-2008, direct effects between Yosemite toad occupancy and livestock utilization in breeding meadows were not significant. Both studies found Yosemite toad occupancy to be associated with meadow wetness. Lind *et al.* (2011) reported high variation in Yosemite toad tadpole and young of the year densities that were strongly influenced by water year type and meadow wetness. Densities were negatively correlated with livestock utilization and depth to water table (Lind *et al.* 2011). Statistically significant negative relationships for tadpole density and grazing intensity (tadpole densities decreased when percent use exceeded between 30 and 40 percent) were reported by Lind *et al.* (2011).

Other studies have found positive, negative, and no association between livestock grazing and amphibians, though most were not conducted in alpine meadows (Adams *et al.* 2009; Bull and Hayes 2000; Burton *et al.* 2009; Ford *et al.* 2013; Jansen and Healey 2003; Knutsen *et al.* 2004). Adams *et al.* (2009) and Bull and Hayes (2000) found no association between various metrics of reproductive success of the Columbia spotted frog and livestock grazing in human-created and natural ponds in northeastern Oregon. Jansen and Healey (2003) found higher amphibian species diversity in low intensity grazed wetlands compared with high intensity grazed wetlands in the Murrumbidgee River floodplains in Australia. Schmutzer *et al.* (2008) found higher species diversity in ungrazed compared with grazed farm ponds on the Cumberland Plateau, Tennessee. Thus, the available literature suggests that the effects of livestock grazing on individuals, populations, and community structure may be variable and there is considerable variability in the responses of different amphibian species. Ecosystem type (e.g., low elevation grasslands, high alpine meadows) may play a role in this variation. Further complicating the ability to distinguish a species' response to livestock grazing is the fact that livestock-related impacts vary significantly in terms of timing, intensity, and duration on an annual basis and many of the processes related to livestock effects on aquatic habitats are long-term.

The Yosemite toad and mountain yellow-legged frog spend all or part of their life in aquatic and meadow systems that also are preferred by livestock (e.g., Vredenburg *et al.* 2005; Allen-Diaz *et al.* 2010 in USFS 2012). Yosemite toads may be exposed to livestock effects in their upland habitats.

Mr. Randy Moore

The three listed amphibians have biological and ecological characteristics that make them vulnerable to livestock and associated activities. In general, they are small, cryptic, move relatively slowly, and often exhibit an immobilization response to danger (Mazerolle *et al.* 2005; Andrews *et al.* 2008). These amphibians move among multiple habitats during their active season and may encounter livestock and associated activities away from aquatic habitats.

Yosemite toads may be injured or killed by trampling and other movements by cattle, entrapment in deep hoof prints or other disturbance. Cattle can step on adults, subadults, metamorphs, and tadpoles while in meadow, terrestrial or sheltering habitat (e.g., burrows, logs, stumps) resulting in injury or death. Eggs and tadpoles have potentially high risk of trampling since these stages have no or low mobility and are often found in very small shallow pools with few escape options. However, the effective implementation of S&G 53 would eliminate the risk for eggs and tadpoles by excluding cattle from breeding areas until after tadpoles metamorphose.

Adult and subadult Yosemite toads also are vulnerable because they are, in general, poor hoppers with low mobility, have an immobilization response to threats, and thus cannot quickly move out of the way of cattle. Recent metamorphs are extremely small (< 1 inch) with very limited escape abilities. The risk of trampling of large numbers of metamorphs is highest if cattle are present during the metamorphosis period when they are concentrated at breeding areas; metamorphs eventually disperse into meadows and uplands. Similarly, outside of the breeding period, adults and subadults generally are dispersed in upland habitats or in meadows. The risk of coming in contact with cattle for all life stages is highest in meadows or near the direct perimeter of meadows. In the Bull Creek Watershed on the Sierra National Forest, Liang (2010) monitored several adults that utilized rodent burrows throughout the summer within 75 feet of a meadow. During a 2-year study in Tioga Pass Meadow, Morton and Pereyra (2010) found 58 percent of 654 adult and subadult toads in the meadow bottoms rather than in upland areas, although adult males comprised the largest component of this group. Females were predominately found in uplands away from meadows. The impacts from upland grazing on individuals in upland habitats are currently unknown. When disturbed while basking at the edge of rodent burrows, Yosemite toad adults and subadults tend to retreat a short distance into the burrow and come back up to the surface in a short amount of time, potentially increasing their risk of being stepped on by nearby cattle. Trampling of rodent burrows used for seasonal or overwintering refuge potentially may crush or injure individuals or trap them underground permanently.

Mountain yellow-legged frogs also may be injured or killed by trampling and other movements by cattle, or entrapment in deep hoof prints. Cattle can step on adults, juveniles metamorphs, and tadpoles while accessing water along streambanks, lakeshores, or meadows, or while foraging for riparian vegetation in these habitats which can result in injury or death. Although eggs are most vulnerable to trampling and disturbance, cattle are not usually present during this period. Mountain yellow-legged frog tadpoles, subadults, and adults are relatively more mobile than Yosemite toads, and generally occur in habitats with more continuous and deeper water that provides more avenues for escape. Tadpoles will rapidly swim away to deeper water in lakes or stream channels. Adults and subadults will leap from the shoreline and submerge themselves under water to hide under stream banks or on the bottom of the lake or stream. However, all life stages commonly bask on shallow shorelines or on stream and lake banks, and are vulnerable to trampling by cattle utilizing these occupied habitats to drink water, cross through habitats (e.g. streams), or forage on emergent or shoreline vegetation.

Activities associated with management of allotments also may affect Yosemite toads and mountain yellow-legged frogs. These activities include maintenance of allotment structures (e.g., fences, corrals, permanent and temporary camps), herding or monitoring individuals by foot or horseback,

keeping of horses in meadows, maintenance of stock trails, and the operation of vehicles to support allotment operations. The Yosemite toad may be more vulnerable to these activities than the more aquatic mountain yellow-legged frog because it uses meadow and upland habitats away from water. Similar to those described for livestock above, these activities may injure or kill individuals by trampling, crush or collapse Yosemite toad burrows with the result of entrapment or mortality, or affect behavior through disturbance.

Various rangeland management practices that are associated with the management of allotments may reduce the likelihood of potential effects to Yosemite toads and mountain yellow-legged frogs. For instance, grazing systems, forage utilization and streambank alteration standards can influence the amount of time that livestock are allowed to linger in a particular area. Range improvements like fences, water developments, and salting as well as other techniques like herding may be used to distribute livestock away from areas where interactions with amphibians are more likely to occur. New facilities may be constructed outside of meadows and conservation areas where the likelihood of potential effects on individuals may be greater.

Grazing has the potential to reduce the suitability of habitat for the mountain yellow-legged frog by reducing its capability to sustain individuals and facilitate dispersal and migration, especially in stream areas. Grazing of livestock in riparian areas impacts the function of the aquatic system in multiple ways, including soil compaction, which increases runoff and decreases water availability to plants; vegetation removal, which promotes increased soil temperatures and evaporation rates at the soil surface; and direct physical damage to the vegetation (Kauffman and Krueger 1984; Cole and Landres 1996; Knapp and Matthews 2002). Streamside vegetation protects and stabilizes streambanks by binding soils to resist erosion and trap sediment (Kauffman *et al.*1983; Chaney *et al.* 1990).

Grazing within mountain yellow-legged frog habitat has been observed to remove vegetative cover, potentially exposing frogs to predation and increased desiccation (Knapp 2005b; Jennings 1996), and to lead to erosion which may silt in ponds and thereby reduce the water depth needed for overwinter survival (Knapp 2005b). An appropriately managed grazing regime, including timing and intensity, can enhance primary riparian vegetation attributes that are strongly correlated to stream channel and riparian soil stability conditions necessary to maintain a functioning riparian system. Although, where highly degraded conditions such as downcut channels exist, grazing management alone may not be sufficient to restore former riparian conditions.

Aquatic habitat can be degraded by livestock grazing. Mass erosion from trampling and hoof slide causes streambank collapse and an accelerated rate of soil transport to streams (Meehan and Platts 1978). Accelerated rates of erosion lead to elevated instream sediment loads and depositions, and changes in stream-channel morphology (Meehan and Platts 1978; Kauffman and Krueger 1984). Livestock grazing may lead to diminished perennial streamflows (Armour *et al.*1994). Livestock can increase nutrient-loading in water bodies due to urination and defecation in or near the water, and can cause elevated bacteria levels in areas where cattle are concentrated (Meehan and Platts 1978; Kauffman and Krueger 1984). With increased grazing intensity, these adverse effects to the aquatic ecosystem increase proportionately (Meehan and Platts 1978; Clary and Kinney 2000). Observational data indicate that livestock can negatively impact mountain yellow-legged frogs by altering riparian habitat (Knapp 2005b). Livestock tend to concentrate along streams and wet areas where there is water and herbaceous vegetation; grazing impacts are, therefore, most pronounced in these habitats (Meehan and Platts 1978; Fleischner 1994; Menke *et al.*1996). Concentration of livestock contributes to the destabilization of streambanks, causing undercuts and bank failures (Kauffman *et al.*1983; Marlow and Pogacnik 1985; Knapp and Matthews 2000a; Moyle *et al.* 1996).

Mr. Randy Moore

Livestock grazing and associated activities may alter the hydrology of meadows, streams, and other aquatic habitats used by the listed amphibians. Livestock grazing may affect multiple interrelated processes that may ultimately result in less available aquatic habitat that dries more quickly during the summer. Heavy trampling by livestock can compact soils which may reduce the infiltration of overland flows and precipitation. Reduced infiltration and increased runoff may decrease the recharge of the saturated zone in meadow and riparian habitats (Platts 1990 in USFS 2003). Livestock grazing can reduce the abundance of protective vegetation, destroy peat layers in meadows, and accelerate streambank erosion which can lead to downcutting of stream channels and lowered water tables (USFS 2003; Service 2013). Downcut channels become confined within narrow, incised channels and are no longer connected to their historical, meadow floodplains. As water tables fall in meadows, their water storage capacity lessens, and they become less suitable for riparian vegetation which may be supplanted by drought-tolerant communities. Acceleration of erosion and gullying of meadows resulting from overgrazing (Kattelmann 1996 in Service 2013) may lead to increased siltation and more rapid meadow succession ultimately resulting in faster meadow drying and encroachment of conifers into meadows (Service 2013). In some cases, formerly perennial streams may become intermittent (Service 2013). These interrelated processes which result in lowered water tables, reduced inundation of flood plains, and faster drying can lead to reduced amounts of surface water that may not remain for sufficient time periods to provide for the ecological requirements of the three listed amphibians.

The wet soil associated with aquatic habitats such as wet meadows, lake shores, and streambanks are particularly vulnerable to trampling by livestock (Marlow and Pogacnik 1985 in Brown *et al.* 2009; Brown *et al.* 2014). Livestock trampling may alter the shallow breeding areas used by the Yosemite toad or the shallow shoreline microhabitats in lakes and streams preferred by the mountain yellow-legged frog and the Yosemite toad. Pock-marking and soil compaction can result from cattle walking in and trailing through breeding sites in wet meadows, stream crossings, and lakeshores. Pock-marks can isolate Yosemite toad tadpoles into smaller pools as meadows dry (USFS 2012) and inhibit metamorph movements. Pock-marks can be moderated by natural freeze and thaw cycles over a period of 5-10 years when rested from grazing (USFS 2014; Menke *et al.* 1996; USFS 2012).

Livestock can modify shoreline habitats by trampling overhanging banks that provide cover for individuals and may contribute to the siltation of breeding pools which may reduce depths making the pools less suitable or unsuitable as breeding habitats for the three species, or as overwintering habitat for mountain yellow-legged frogs (Service 2013). Livestock trampling and erosion may result in progressively wider and shallower stream channels (USFS 2003). Changes in shoreline topography can alter water temperatures and drying patterns which can affect development rates and survival to metamorphosis; these effects may be positive or negative depending on the circumstances.

Animal wastes could directly impair water quality through bacterial contamination or increasing nutrient levels (EPA 1991; Derlet *et al.* 2006, 2008, 2010 in USFS 2012). Reduction in water quality may compromise immune function by inducing stress thus making larvae more susceptible to pathogens (USFS 2012). Increased nutrient loading may result in delayed metamorphosis or reduced size at metamorphosis (Gerlanc and Kaufman 2005 in USFS 2014). A delay in metamorphosis could make tadpoles more vulnerable to mortality from mid-season (August) desiccation, snowfall or freezing. A reduced size at metamorphosis could affect the fitness of individuals following metamorphosis and prior to overwintering (USFS 2014).

Allen-Diaz *et al.* (2010) found that Yosemite toad occupancy is strongly driven by meadow wetness (hydrology), and suggested that future studies should focus on contemporary factors directly impacting meadow wetness, such as climate, fire regime changes, and conifer encroachment. A

positive relationship was found between meadow dryness and livestock use, e.g., cattle prefer drier meadows, and they found that proportion of toad-occupied pools and tadpole and young-of-year densities declined in drier sites, e.g., toads prefer wetter meadows (Lind *et al.* 2011). Lind *et al.* (2011) suggested this has resulted in some segregation of the Yosemite toad and livestock use in meadow habitats. The initial results of Diaz *et al.* (2010) are inconclusive as to the impacts of grazing on Yosemite toad population's rangewide. Diaz *et al.* (2010) did not utilize sufficient statistical power in their analysis that would allow discrimination over time of the treatment effect for longer-lived species with irregular female breeding activity. A time lag may occur between effect and discernable impacts even if monitoring is sufficiently robust to determine population level responses. Significant variation was observed in young-of-year occupancy in pools between meadows and years, and within meadows over years (Allen-Diaz *et al.* 2010). This variability would likely mask treatment effects, unless the grazing variable was a dominant factor driving site occupancy and the magnitude of the effect was quite severe.

Effects to the listed amphibians may occur through structural improvements of dams, impoundments, ponds, pipelines, fences, corrals, wells, and trails. For example if ponds are drained for maintenance they could temporarily eliminate breeding habitat. Short-term and temporary adverse effects from displaced individuals could occur during fence maintenance.

The Forest Service grazing guidelines for protection of meadow habitats of the Yosemite toad require fencing of breeding meadows, but they may not provide sufficient protections for upland habitat. Given the observation that livestock grazing significantly reduced vegetation height and Yosemite toad use of grazed meadows, and these areas are unprotected by current grazing guidelines, Martin (2008) deduced that cattle grazing is having a negative effect on terrestrial life stage survivorship. This problem is exacerbated as fenced areas effectively shifted grazing activity to upland areas actively used by terrestrial life stages of the toad (Martin 2008).

The Forest Service will develop and implement a monitoring program in conjunction with the Service to further assess the effectiveness of the Conservation Measures that will includes compliance, their success in minimizing adverse effects to the three listed amphibians, and appropriate modifications or changes to minimize the effects.

The S&Gs and BMPs when properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Range Management Program through protection of water quality; seasonal restrictions; and other activities as described in the conservation measures of this programmatic biological opinion.

6. Biological Resources Management

This Biological Resources Management program likely will result in long term beneficial effects for the three listed amphibians, however, it likely that there will be short-term adverse effects. Survey and monitoring, along with associated handling and marking of individuals, and enhancement of habitat may result in short-term disturbance and/or harassment and, rarely, inadvertent injury or death of individual animals. Marking, attaching radios, or swabbing for chytrid fungus will result in capture and harassment, and possibly injury or death if conducted by non-Service approved biologists.

The increase in human activity associated with handling, marking, swabbing individuals of the three listed amphibian species, and habitat enhancement or restoration has the potential to spread diseases such as chytrid fungus. Chytrid outbreaks have caused extirpation of populations of mountain yellow-legged frogs, and is one the leading causes of the decline of these species. Human activity

associated with surveys and habitat work has the potential to attract predators such as corvids (Olson 1989, Kagarise Sherman and Morton 1993), which under normal circumstances, may not have been alerted or noticed the presence of the listed species.

Certain restoration activities designed and intended for other purposes have the potential to indirectly adversely affect the three listed species. Projects may that eliminate or reduce pooling of surface water, such as the removal of user-created dams, could result in the desiccation of tadpoles and egg masses leading to injury, death and the loss of recruitment. Removal of barriers to fish passage, e.g., the creation or enhancement for the passage of aquatic organisms, can facilitate the invasion of predatory fish, including trout, into areas where they had previously not inhabited or from which they have been eradicated. Restoration activities that create ponded water may create additional habitat for the three listed species, but also may benefit American bullfrogs, predatory fish, or other nonnative species (Brown *et al.* 2014). American bullfrogs and other exotic species, such as non-native crayfish, have an adverse effect because they are predators on other related ranids.

Harassment, harm, injury, or death of the three listed amphibians could result from activities intended to restore, protect, maintain, or improve aquatic and riparian habitats, such as the restoration of streams and meadows, prevention of lodgepole encroachment, planting, blocking/disguising unauthorized vehicle or trail routes, fencing, and the removal of trash, etc. However, these projects are designed to improve habitats, and the long-term benefits to the three listed amphibians likely will outweigh the initial short-term adverse effects. For example, meadow restoration that increases water tables and the connectivity of water to floodplains is likely to increase the amount and duration of occupied or suitable habitat.

The S&Gs and BMPs when properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Biological Resource Management Program through restriction of the use of wheeled vehicles and chemicals; storage of fuel and other toxic materials outside of riparian habitat; and other activities as described in the conservation measures of this programmatic biological opinion.

7. Invasive Species Management

The invasive species management program likely will result in initial short-term adverse effects to the three listed amphibians in the form of displacement, injury, and death. Invasive species management could result in harm through changes in water quality and sedimentation at and downstream of areas of activities.

Nonnative fish species within alpine lakes are removed to restore habitat for the mountain yellow-legged frog. Fish removal is a highly effective restoration tool with well-documented benefits (Vredenburg 2004; Knapp *et al.* 2007). Potential short-term adverse effects include harassment, capture, injury, and death when gill nets are deployed, retrieved or operated. The increase in human activity associated with the removal of predatory fish with gill nets or electro-fishery equipment has the potential to spread diseases such as chytrid fungus. Chytrid outbreaks have caused extirpation of populations of mountain yellow-legged frogs, and is one the leading causes of the decline of these species. Human activity associated with fish removal has the potential to attract predators such as ravens, blackbirds, and Clark's nutcrackers (Olson 1989, Kagarise Sherman and Morton 1993), who under normal circumstances, may not have been alerted or noticed the presence of the listed species.

The physical removal of non-native or undesirable plants may result in displacement, injury and death caused by the disturbance and trampling of native riparian vegetation trampling of

streambanks and shorelines, heavy equipment, and increased sedimentation. However, physical removal and control of non-native plants or unwanted plant growth, such as lodgepole pine invasion of alpine meadows, will be a beneficial effect to the three listed amphibians by allowing native vegetation to recover, reverse or halt the drying of meadows and water depletion, and eliminate or slow the unwanted expansion of vegetative growth into suitable and occupied habitats, especially mountain meadows.

The S&Gs and BMPs when properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Invasive Species Management Program through restriction of the use of wheeled vehicles and chemicals; storage of fuel and other toxic materials outside of riparian habitat; and other activities as described in the conservation measures of this programmatic biological opinion that reduce the likelihood and severity of exposure of the amphibians to adverse effects of these activities.

8. Mining

Most mining in the Sierra Nevada is in the westside foothills and east of the range in Inyo County, outside the boundaries of most National Forests (USFS 2001b). The majority of these areas are below the ranges of the two frog species; however, mining activities may affect the Sierra Nevada yellow-legged frog on the Plumas National Forest. Mining is one of the historical activities that have had some of the most significant impacts on Sierra Nevada streams (USFS 2001b).

The intensity and extent of the adverse effects of mining on the three listed amphibians depend on the mining technology employed, extent of disturbance, chemical and physical composition of the mineral, surface and subsurface hydrologic pattern, and method of reclamation (Harvey and Lisle 1998; Haugen and Duff 1982; Ott 1985; Nelson *et al.* 1991). The potential effects from mining in or near occupied or suitable habitats of the three amphibian species include harm, harassment, capture, injury, and death as a result of human or mechanical activities. Harassment may result from actual mining, reclamation activities, or from the increased presence of humans. This may alter the behavior of individuals, including feeding, mating, movement, and resting, potentially resulting in their injury or death.

Suction dredging may capture, harm, harass, injure, or kill trap and kill the three listed amphibians, especially the mountain yellow-legged frog. Increases in sedimentation downstream of suction dredging activities may bury and suffocate eggs and larvae (CDFG 1994, Brown *et al.* 2014).

Mining and associated activities may alter water quality (California States Lands Commission 1993; Larson 1996) for the three listed amphibians. Weathering and erosion of rock exposed by mining can potentially increase pollutants such as acid, cadmium, mercury, and asbestos in waterways (CSLC 1993), and water can solubilize potentially toxic metals exposed through mining activities (Brown *et al.* 2014). Fuels and other chemical pollutants associated with mining-associated machinery potentially may enter waterways. For example, suction dredging equipment usually is operated in stream channels and fuel spills are possible (USFS 2001a). Chemical pollutants also may enter suitable or occupied habitat from road use, maintenance, and other activities associated with mining. Although the effects of mining-associated toxicity to on the three listed amphibians have not been investigated, they may be particularly vulnerable because of their permeable skin and aquatic life stages.

Mining activities may alter the hydrology of aquatic habitats through water impoundments or diversions, or through changes to stream channel morphology including channel downcutting. Harm to the three listed amphibians could result from activities that alter stream flows or other

hydrological processes causing the degradation or elimination of suitable or occupied habitat. In the Sierra Nevada, mining activities affecting aquatic habitats are most prevalent in streams and pose a risk to stream-inhabiting populations of the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frogs. The creation of ponds or other water impoundments associated with mining may be invaded by predatory non-native species such as bullfrogs or predatory fish that may eat individuals of the three listed amphibians, or serve as a source population for dispersing exotic animals.

Mining activities may cause harm to the three listed amphibians by alteration of available cover in suitable or occupied habitat through the removal of substrate or changing its composition, removal or disturbance of riparian, meadow, or upland vegetation, or by increasing sedimentation. Mining that occurs in the Yosemite toads' suitable or occupied upland habitat may crush or eliminate burrows, important refugia for adults and subadults, or may result in their harassment, capture, injury or death. Riparian vegetation provides an important structural role in streams by stabilizing stream banks. The elimination or degradation of riparian vegetation by mining may increase erosion, sedimentation, and alterations to stream channel morphology. Mining often removes or re-arranges large amounts of substrate. For example, the tailings from suction dredges often form mounds of loose and unconsolidated gravels and cobbles which are easily moved during high flows. Loss of cobble or other medium-sized substrates that frogs use for cover may increase their risk of predation. Increased levels of sediment resulting from mining and associated activities may embed larger substrates which could further reduce available cover for the three listed amphibians. The effect of increased sedimentation on the Sierra Nevada yellow-legged frog, Northern Distinct Population of the mountain yellow-legged frog, and the Yosemite toad has not been investigated, however, studies have shown impacts to fish, macroinvertebrates, periphyton (Power 1990; Newcombe and MacDonald 1991), and at least one study found reduced amphibian densities in streams following road construction (Brown *et al.* 2014). Sedimentation may embed substrate reducing refugia and causing other habitat modifications (Brown *et al.* 2014).

The Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad require warm water, basking sites, and cover from predators. Changes to microclimates caused by mining activities may affect growth and survival. Reduction of riparian vegetation cover may benefit the three species by increasing the amount of available warm water habitat and basking sites or may adversely affect them if temperatures increase higher than thermal tolerances, or if other cover from predation is not available.

The S&Gs, and BMPs when properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Mining Program through the withdrawal of critical aquatic refuges for 20 years; protection of hydrology by mine reclamation; limiting new road construction; protection of water quality; and other activities described in the conservation measures of the programmatic biological opinion.

9. Lands and Real Estate

Most activities associated with major land acquisitions, developments, and reclamation of lands and facilities are considered individual actions with separate project-related NEPA and individual section 7 consultations. The appropriate listed amphibian species likely will benefit when lands are acquired that include their populations and/or suitable habitat.

The S&Gs and BMPs properly implemented, coupled with site-specific conservation measures, will minimize the adverse effects to the three listed amphibian species resulting from the Lands and Real Estate Program through restriction of conducting land surveys and marking of property boundaries

by one or two people with specialized equipment as described in the conservation measures of this programmatic biological opinion.

Effects to Critical Habitat for the Sierra Nevada yellow-legged frog, the Northern DPS of the Mountain Yellow-legged Frog, and Yosemite Toad

The PCEs specific to the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog are: (1) Aquatic habitat for breeding and rearing; (2) aquatic non-breeding habitat; and (3) upland areas. All three of these PCEs may be adversely impacted during implementation of activities permitted or carried out under the 9 Forest Service programs analyzed in this programmatic biological opinion. The PCEs specific to the Yosemite toad are: (1) Aquatic breeding habitat; and, (2) upland areas. The PCEs for the three amphibians may be adversely impacted during implementation of the 9 Forest Service programs analyzed in this programmatic biological opinion. Effects to individuals and their habitat resulting from these activities are described in more detail in the previous sections describing effects to the species; however, a brief description of the potential effects to the PCEs for the three listed amphibians follows.

1. Vegetation Management, Timber Harvest, Fuels Management and Watershed Restoration

Vegetation management, timber harvest, and fuels management activities may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Many of the activities associated with vegetation management, timber harvest, fuels management and watershed restoration could increase sedimentation and turbidity levels in aquatic habitats, which could decrease successful egg development and result in slower larvae development. Earthmoving, yarding, skidding, and construction of temporary roads, skid trails, and landings could increase sediment loads into aquatic habitats through disturbance of soil through use of heavy equipment, removal of vegetation, and soil compaction. Prescribed fire activities will remove vegetation and tree roots that provided soil stability and cover, which could increase soil run-off during rain and snowmelt events which may increase sedimentation and channel scour. The increase in sedimentation from these activities could result in short-term and temporary adverse effects to localized breeding habitat. High levels of sedimentation may fill deep pools used by mountain yellow-legged frogs for breeding and non-breeding activities. Upland habitat will be impacted because of soil disturbance to burrows, basking sites, foraging sites, and overwintering sites. Potential alterations to upland habitat include removal of refugia such as downed logs, tree stumps, and vegetation. Foraging habitat may be impacted by many of these activities, thereby decreasing available prey for the three amphibians.

Watershed restoration activities may involve initial ground disturbance that may increase soil erosion through vegetation removal. Restoration activities may temporarily disrupt hydrology if streams are dewatered during construction activities. These adverse effects to primary constituent elements will be localized and short-term in nature and the restoration actions will result in long-term benefits such as returning meadows and streams to a more natural state, resulting in higher water quality in breeding and non-breeding aquatic habitat for the three amphibians. Similarly, vegetation management and fuels management activities may have short-term adverse effects but will result in improved upland and aquatic habitat conditions over time that reduce the likelihood of future high intensity wildfire and improve ecosystem health resulting in higher prey base, improved refugia habitat, and increases population numbers for the three amphibians.

Mr. Randy Moore

The Forest Service will implement BMPs and S&Gs (see appendices A and B) to ensure adequate buffers for aquatic habitat (breeding and non-breeding) and protect water quality by helping to stabilize soils, increase ground cover and provide improved infiltration. Forest Service activities include enhancement of native vegetation, stream restoration, and other beneficial activities. Designation of RCAs and CARs, along with the implementation of applicable BMPs and S&Gs proposed by the Forest Service will improve habitat functions of the primary constituent elements.

2. Road and Trail Maintenance

Road and trail maintenance may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Road and trail maintenance activities may remove vegetation, disturb and/or compact soil, which may result in increased sedimentation levels entering aquatic breeding habitat, thereby decreasing breeding success. Drafting of water for road and trail maintenance may result in adverse effects to aquatic habitat. In-stream water drafting can substantially affect water flow resulting in rapid changes or sustained reductions in flow, reduced dissolved oxygen, and/or increased water temperatures which could affect habitat suitability for the three listed amphibians. Road and trail maintenance activities within upland areas could disturb burrows, stumps, and downed wood utilized by Yosemite toad as refugia habitat. Upland foraging habitat may be temporarily disturbed by road and trail maintenance activities, thereby decreasing available foraging opportunities for the three amphibians.

Most of these activities are anticipated to result in localized and temporary adverse effects to the primary constituent elements for the listed amphibians. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to ensure adequate buffers for aquatic habitat (breeding and non-breeding) and protect water quality by ensuring that road and maintenance activities implement project-specific erosion control plans designed to minimize erosion and sediment delivery to streams, wet meadows, and other aquatic features utilized by the three amphibians for breeding and non-breeding activities. Designation of RCAs and CARs, along with the implementation of applicable BMPs and S&Gs proposed by the Forest Service will minimize potential adverse effects to the primary constituent elements.

3. Maintenance of Developed Recreation and Administrative Infrastructure

Maintenance of developed recreation and administrative infrastructure may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Maintenance of campgrounds, day use facilities, parking lots, visitor centers, and other recreation infrastructure may result in adverse effects to upland habitat. Vegetation may be disturbed if humans trample plants, which may create patches of disturbed bare soil, thereby influencing prey availability by changing the prey's habitat. Humans may accidentally crush mammal burrows, dislodge rocks, wood and other cover decreasing available refugia habitat. Roads, parking lots, and other paved or compacted surfaces may lead to increased runoff altering hydrology which may ultimately affect water availability and duration in nearby aquatic habitats. Minor maintenance activities may occur in wilderness areas, such as repair of vault toilets, however these adverse effects to PCEs will be very minor in nature.

Dead or dying trees within falling distance of administrative facilities are routinely felled and/or removed in order to provide for public safety. Within upland areas, felling of hazard trees can destroy or alter cover components such as burrows, logs, tree roots, or stumps. Vegetation management of both native and non-native species to protect facilities and infrastructure may decrease upland habitat quality by removing cover for the species and increasing risk of predation. The clearing of vegetation as part of routine maintenance is likely to have minimal effect on aquatic habitats.

Most of these activities are anticipated to result in localized and temporary adverse effects to the primary constituent elements for the listed amphibians and are not expected to result in permanent or long-term adverse effects. However, some of the proposed maintenance activities may occur annually or more often, thereby increasing the level of adverse effects to the primary constituent elements. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to protect riparian vegetation, wetlands and other aquatic features. Designation of RCAs and CARs, along with the implementation of applicable BMPs and S&Gs proposed by the Forest Service will minimize adverse effects to the primary constituent elements within critical habitat for these amphibian species.

4. Special Use Permits

Activities related to special use permits may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Activities authorized by Special Use Permits may alter habitats including cover, hydrology, water quality, and sedimentation. Special use activities such as clearing of vegetation for routine maintenance of right of ways and transmission lines may result in adverse effects to upland refugia and foraging habitat for the three amphibians. Many of these effects to PCEs are similar in nature to the effects summarized in Section 1, above: *Vegetation Management, Timber Harvest, Fuels Management and Watershed Restoration.*

Special uses involving water developments such as dams, diversions, and impoundments can alter aquatic breeding and non-breeding habitats. Water may be diverted under Special Use Permits for a number of purposes including hydroelectric generation, drinking water, or water storage. Water diversions can adversely affect breeding and non-breeding aquatic habitat by decreasing the length of time surface water is present, which can lead to a reduction or failure of successful breeding. Various activities covered by Special Use Permits may contribute to increased sedimentation in nearby aquatic habitat if ground-disturbing machinery is used. Sedimentation can alter the morphology of aquatic habitats by filling in pools in streams, and reduce cover by filling interstitial spaces in stream and lake substrates. Activities requiring Special Use Permits may decrease the quality of breeding and non-breeding aquatic habitat. For example, the construction or maintenance of roads, parking lots, and other paved or compacted surfaces may lead to diverted or increased runoff that alters hydrology. This may ultimately affect water availability in nearby breeding and non-breeding aquatic habitat.

Some of these activities are anticipated to result in localized and temporary adverse effects to the primary constituent elements for the listed amphibians, such as races or other events. Other activities authorized under Special Use Permits may result in long-term or permanent adverse effects to primary constituent elements, such as corridors for power lines or expansion of ski areas or parking lots or other paved areas. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to ensure adequate buffers for aquatic habitat (breeding and non-breeding) and

protect water quality by ensuring that project proponents implement project-specific erosion control plans designed to minimize erosion and sediment delivery to streams, wet meadows, and other aquatic features utilized by the three amphibians for breeding and non-breeding activities. Designation of RCAs and CARs, along with the implementation of applicable BMPs and S&Gs proposed by the Forest Service will minimize potential adverse effects to the primary constituent elements.

5. Rangeland Management

Rangeland management activities may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Grazing allotments overlap with 257,711 acres of critical habitat for the Yosemite toad, 153,426 acres of critical habitat for Sierra Nevada yellow-legged frog, and 7,590 acres of critical habitat for the Northern DPS of the mountain yellow-legged frog.

Grazing has the potential to reduce the suitability of aquatic and upland habitat for the three amphibians in multiple ways, including soil compaction, which increases run-off and decreases the amount of available aquatic stream habitat for the Sierra Nevada yellow-legged frogs and mountain yellow-legged frogs. Reduced stream-side vegetation can decrease soil stability and increase soil erosion along streams and in ponds. Grazing over long periods of time may result in downcut stream channels. Downcut channels become confined within narrow, incised channels and are no longer connected to the historical meadow floodplain, lowering the water table and resulting in faster meadow drying and meadow vegetation receiving less water. This may decrease the amount of available breeding habitat for the three amphibians. Mass erosion from trampling and hoof slide can cause streambanks to collapse and accelerate erosion. Increased erosion in breeding habitat may decrease water quality and affect breeding success. In upland areas, riparian vegetation may be removed, reducing the available cover for amphibian species. Livestock may crush burrows, reducing the amount of refugia habitat available to the Yosemite toad.

The Forest Service will implement BMPs and S&Gs (see appendices A and B) to protect the PCEs for riparian vegetation, streams, wetlands, and other aquatic features to minimize potential adverse effects to the aquatic PCE habitat for the three amphibians. Grazing on an allotment is conducted in accordance with an Allotment Management Plan which is incorporated into the term grazing permit. Annual Operating Instructions include annual adjustments to management based on monitoring and site specific objectives, and can be revised to ensure that aquatic and upland PCEs are maintained or improved for the three amphibians. Adverse effects can be further minimized through pasture rotations and use of utilization standards.

6. Biological Resources Management

Biological resource management activities may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Overall, the Biological Resources Management program likely will result in long term beneficial effects on the primary constituent elements for the three listed amphibians; however, there is potential for short-term adverse effects to occur as well. Restoration activities designed and intended for purposes not

related to the three amphibians have the potential to indirectly adversely affect the primary constituent elements for the three listed species. Projects that remove dams could result in the loss of available breeding habitat for the frogs. Removal of barriers to fish passage will typically require temporary instream work that may decrease water quality by increasing sediment loads. Projects that require dewatering may alter the hydrology of streams temporarily, decreasing available aquatic breeding and non-breeding habitat. Restoration activities that create ponded water may create additional habitat for the three listed species, but also may benefit American bullfrogs, predatory fish, or other non-native species.

Most of these activities are anticipated to result in localized and temporary adverse effects to the primary constituent elements for the listed amphibians and are not expected to result in permanent or long-term adverse effects. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to ensure adequate buffers for aquatic habitat (breeding and non-breeding) and protect water quality by implementing project-specific erosion control plans designed to minimize erosion and sediment delivery to streams, wet meadows, and other aquatic features utilized by the three amphibians for breeding and non-breeding activities. Implementation of applicable BMPs and S&Gs proposed by the Forest Service will minimize potential adverse effects to the primary constituent elements and help ensure that they result in no long-term or permanent degradation or loss of function.

7. Invasive Species Management

Invasive species management activities may be conducted adjacent to and within habitat containing primary constituent elements for the three listed amphibian species. These include breeding and non-breeding aquatic habitat (PCE 1 and 2) and upland habitat (PCE 3) for the Sierra Nevada yellow-legged frog and the Northern DPS of the mountain yellow-legged frog and breeding aquatic habitat (PCE 1) and upland habitat (PCE 2) for the Yosemite toad. Invasive species management activities could result in changes in water quality and sedimentation within the project area and downstream, resulting in decreased quality of breeding habitat. Heavy equipment may be used to remove non-native or undesirable plants which may result in disturbance of vegetation in riparian and upland areas, resulting in decreased upland refugia habitat. However, physical removal and control of non-native plants or unwanted plant growth will result in overall long-term benefits to the three Sierra Amphibians. For example, removal of lodgepole pines within alpine meadow habitat will slow the encroachment of vegetative growth into meadows, resulting in sustained meadow breeding habitat for the three amphibians.

Most of these activities are anticipated to result in localized and temporary adverse effects to the primary constituent elements for the listed amphibians and are not expected to result in permanent or long-term adverse effects. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to minimize adverse effects to the PCEs for the three amphibians. Overall, invasive species management will benefit the three amphibians by increasing the amount of native plant species present within the critical habitat units, which results in overall long-term improvements in ecological health, including improved function of PCEs (e.g., increased amounts of prey species, supporting small mammals that create burrows for refugia, and establishing native vegetation that can be used for refugia).

8. Mining

Mining activities may alter the hydrology of aquatic habitat containing PCEs through water impoundments or diversions, or through changes to stream channel morphology including channel down-cutting. Mining activities may alter stream flows or other hydrological processes causing the

degradation or elimination of suitable or occupied habitat. In the Sierra Nevada, mining activities affecting aquatic habitats are most prevalent in streams and pose a risk to stream-inhabiting populations of the Sierra Nevada yellow-legged frog and the Northern Distinct Population Segment of the mountain yellow-legged frogs. Riparian vegetation provides an important structural role in streams by stabilizing stream banks and the elimination or degradation of riparian vegetation by mining may increase erosion, sedimentation, and alterations to stream channel morphology. Mining activities may degrade Yosemite toad habitat containing upland primary constituent elements by crushing or eliminating burrows.

Mining activities have the potential to result in long-term and permanent adverse effects to primary constituent elements, although some activities may be short-term and temporary in nature. The Forest Service will implement BMPs and S&Gs (see appendices A and B) to ensure adequate buffers for aquatic habitat (breeding and non-breeding) and protect water quality by ensuring that project proponents implement project-specific erosion control plans designed to minimize erosion and sediment delivery to streams, wet meadows, and other aquatic features utilized by the three amphibians for breeding and non-breeding activities. The Forest Service will implement measures to protect water quality. Designation of RCAs and CARs, along with the implementation of applicable BMPs and S&Gs proposed by the Forest Service will minimize potential adverse effects to the primary constituent elements.

9. Lands and Real Estate

Activities related to the Lands and Real Estate program may result in adverse effects to PCEs of the three listed amphibians; however, the Service believes that these effects will be minimal. For example, survey crews may trample vegetation or small mammal burrows within upland areas or along stream banks. The listed amphibian species likely will benefit when lands are acquired that include primary constituent elements.

Summary of Effects to Critical Habitat

The Service anticipates that the Forest Service activities covered under this programmatic biological opinion will have the potential to adversely affect the primary constituent elements for the three amphibians, as discussed previously. The Forest Service will implement the applicable S&Gs and BMPs, and in some instances, additional site specific conservation measures, which will greatly minimize the adverse effects to the primary constituent elements for the three listed amphibians. In particular, special focus is given to riparian areas, lakes, ponds, wet meadows, and other aquatic features through the prescribed measures implemented in CARs and RCAs. Most habitat manipulation activities are temporary and designed to improve the integrity of terrestrial and aquatic habitat essential to the three amphibians. Many Forest Service activities will improve the resiliency of terrestrial and aquatic habitat to fire, drought, and climate change impacts. The Forest Service activities are not anticipated to eliminate primary constituent elements and designated critical habitat within Forest Service lands will continue to serve its intended conservation role for the three amphibians.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Lands administered by the 9 national forests are interspersed and surrounded by non-Federal lands. Activities conducted on these private lands are similar to the

activities conducted by the Forest Service and covered under this programmatic biological opinion, including grazing, timber and vegetation management, and mining. While these activities do not occur within the action area, there is potential that there could be indirect effects to the three listed amphibians and their primary constituent elements if these activities occur adjacent or upstream of Forest Service lands. Specific projects on adjacent non-federal lands were not identified during this consultation.

Conclusion

After reviewing the current status of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad, the environmental baseline for the action area, effects of the proposed action, and the cumulative effects, it is the Service's conclusion that the Nine Forest Programs on Nine National Forests in the Sierra Nevada, as proposed, is not likely to jeopardize the continued existence of these three amphibian species. The Service reached this conclusion because for each project appended to this programmatic biological opinion, the Forest Service will fully implement the appropriate Conservation Measures.

After reviewing the current status of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad, the environmental baseline for the action area, effects of the proposed action, and the cumulative effects, it is the Service's conclusion that the Nine Forest Programs on Nine National Forests in the Sierra Nevada, as proposed, is not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to the designated critical habitat, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding the function of the critical habitat to serve its intended conservation role for the species. The Service reached this conclusion because for each project appended to this programmatic biological opinion, the Forest Service will fully implement the appropriate Conservation Measures.

PROGRAMMATIC INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the Forest Service so that they become binding conditions of any grant, contract, or permit issued by the Forest Service as appropriate, in order for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Forest Service: (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, contract, or grant document; and/or (2) fails

to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service must report the progress of the action and its impact on the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad to the Service as specified in the incidental take statement (50 CFR §402.14(i)(3)).

Amount or Extent of Take

Based on information provided by the Forest Service in their BA, we are reasonably certain that incidental take of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the, Yosemite toad will occur. However, the specific amount or extent of incidental take of these species is unquantifiable at this time because this consultation has analyzed the nine Forest programs in the Sierra Nevada at a programmatic level and we lack the site specific details of where, when, how, and to what extent listed species will be affected by the Forest programs. The programmatic action analyzed in this biological opinion only establishes a framework for the development of specific future actions but does not authorize any future actions. Therefore, no exemption from section 9 of the Act is granted in this programmatic biological opinion. The Forest Service will submit individual projects to the Service for specific review and analysis by the Service. If appropriate, incidental take will be authorized upon appendage of the specific project to this programmatic biological opinion.

Effect of the Take

No incidental take is authorized by this programmatic biological opinion for the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad.

Reasonable and Prudent Measures

1. The Forest Service shall request appropriate specific projects that may adversely affect the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad be appended to this programmatic biological opinion.

2. The Forest Service shall minimize adverse effects to the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad by implementing the project description as described with the additional terms and conditions below.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions, which implements the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The following Term and Condition implements Reasonable and Prudent Measure One (1):

   The Forest Service shall ensure each project submitted for appendage to this programmatic biological opinion meets the conditions and requirements in the project description of this document.

2. The following Term and Condition implements Reasonable and Prudent Measure two (2):

   a. The Forest Service shall implement the conservation measures described within the Biological Assessment and the project description of this programmatic biological opinion.

   b. Tightly woven fiber netting or similar material shall be not used for erosion control or other purposes where the nine Forest programs are implemented within suitable habitat to ensure that the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and Yosemite toad do not get trapped, injured or killed. Plastic mono-filament netting or similar material shall not be used at any of these projects because individuals of these listed species may become entangled or trapped in it.

   c. If appropriate, the Forest Service shall move the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad from within project sites where the nine Forest programs are implemented to a safe location if they are in danger. (See Appendix C of this Programmatic Biological Opinion)

      i. Each Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad encounter shall be treated on a case-by-case, but the general procedure is as follows: (1) leave the non-injured animal alone if it is not in danger; or (2) move the animal to a nearby safe location if it is in danger. These two actions are further described below:

         (a) When a Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad is encountered within the project site, the first priority is to stop all activities in the surrounding area that may have the potential to result in the harassment, injury, or death of the individual. Then, the situation shall be assessed by a Forest Service biologist or Service-approved biologist in order to select a course of action that will minimize adverse effects to the individual.

         (b) Avoidance is the preferred option if an individual of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and/or Yosemite toad is not moving or using a burrow or other refugia. A Forest Service biologist or Service-approved biologist shall inspect the animal and the area to evaluate the necessity of fencing, signage, or other measures to protect the animal.

         (c) If appropriate, the three listed amphibians shall be allowed to move out of the hazardous situation on their own volition to a safe location. An animal shall not be picked up and moved based on it not moving fast enough or it is an inconvenience for activities associated with rehabilitation or operation. This only applies to situations where individuals are encountered when they are moving during conditions that make their upland travel feasible. It does not apply to individuals that are uncovered, exposed, or in areas where there is not sufficient adjacent habitat to support the species should the animal move outside the immediate area.

         (d) Individuals of the three listed species shall be captured and moved by hand only when it is necessary to prevent harassment, injury, or death. If suitable habitat is located immediately adjacent to the capture location, then the preferred option is relocation to that site. An individual shall not be moved outside of the radius it

would have traveled on its own. Under no circumstances shall they be relocated to a non-Forest Service property without the landowner's written permission.

(e) Only Forest Service biologists or Service-approved biologists may capture the three listed amphibians. Nets or bare hands may be used to capture the animals. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within two hours before and during periods when the biologist is capturing and relocating individuals. If the animal is held for any length of time in captivity, they shall be kept in a cool, dark, moist environment with proper airflow, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting shall not contain any standing water, or objects or chemicals that may injury or kill a Yosemite toad, Northern Distinct Population Segment of the mountain yellow-legged frog, and/or Sierra Nevada yellow-legged frog.

(f) To avoid transferring disease or pathogens between suitable habitats during the course of translocating the three listed amphibians, Forest Service biologists or the Service-approved biologist shall use the following guidance for disinfecting equipment and clothing. These guidelines are adapted from the *Declining Amphibian Population Task Force's Code* which can be found in their entirety at: *http://www.open.ac.uk/daptf/*.

(g) At the project level, if adverse effects occur within suitable habitat, these areas will be restored to pre-existing conditions within one breeding season.

(h) Restoration will be implemented within the project area for areas at risk for erosion, such as those with soil compaction, lowered water tables, and downcutting and gullies (per S&G 122), if there is an adverse effect to suitable habitat for the three listed amphibians.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of a project appended to this programmatic biological opinion, the level of incidental take described for the specific listed amphibian is exceeded, such incidental take represents new information requiring review of the project, and, if appropriate, reinitiation of programmatic consultation and review of the reasonable and prudent measures provided. The Forest Service must provide an explanation of the causes of the take as soon as possible and review with the Service the need for possible review of the project, or modification of the reasonable and prudent measures.

Reporting Requirements

For projects appended to this programmatic biological opinion, injured Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad shall be cared for by a licensed veterinarian or other qualified person such as a Forest Service biologist or a biologist possess a valid section 10(a)(1)(A) permit for the appropriate listed species; dead individuals must be placed in a sealed plastic bag with the date, time, location of discovery, and the name of the person who found the animal; the carcass shall be kept in a freezer; and held in a secure location. The Service must be notified within one (1) working day of the discovery of death or injury to a Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad that occur due to project related activities or is observed or recovered at the project site. Notification will include the date, time, and location of the

incident or of the finding of a dead or injured animal clearly indicated on a U.S. Geological Survey 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Forest Service shall contact the appropriate Service Fish and Wildlife Office (FWO). The Reno FWO Field Supervisor should be contacted for the Inyo National Forest and the Lake Tahoe Basin Management Unit; the Sierra/Cascades Division Chief of the Sacramento FWO should be contacted for the remaining national forests).

The Forest Service shall submit an annual compliance report to the Sacramento Fish and Wildlife Office on or before March 1 for the projects appended to this programmatic biological opinion during the previous calendar year. This report shall include for each appended project (1) Project name, name of National Forest, Forest program, listed amphibian affected, dates implemented, location of each project, acreage of project, project activities which could have resulted in incidental take; (2) GIS layer of polygon of the appended projects; (3) other pertinent information. The reports shall be addressed to the Chief of the Sierra Cascades Division at the Sacramento Fish and Wildlife Office.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and databases. The Service has the following recommendations:

1. The Forest Service should continue their collaborative efforts to eliminate non-native trout from suitable habitat where they have been introduced within the ranges of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad.
2. The Forest Service should assist the Service in implementing the Conservation Strategy, and when completed, the final recovery plan for the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad.
3. The Forest Service should provide interpretive signs and other information to educate visitors about the three amphibian species.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any of the conservation recommendations.

REINITIATION – CLOSING NOTICE

This concludes programmatic formal consultation on the effects of nine Forest programs on nine National Forests in the Sierra Nevada of California that adversely affect the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take for a project(s) appended to this programmatic biological opinion is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this programmatic biological opinion; (3) the agency action (appended project) is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not

considered in this programmatic biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take, including projects appended to this programmatic biological opinion, must cease pending reinitiation.

If you have questions about this programmatic biological opinion, please contact Rick Kuyper or Jan Knight in our Endangered Species Program at the letterhead address, or email (Richard_Kuyper@fws.gov; Jan_Knight@fws.gov) or at telephone (916) 414-6621.

Sincerely,

Jennifer M. Norris
Field Supervisor

Enclosure

cc:
Diana Craig, U.S. Forest Service, Vallejo, California

Mr. Randy Moore

Literature Cited

Adams, M.J., C.A. Pearl, B. McCreary, S.K. Galvan. 2009. Short-term effect of cattle exclosures on Columbia spotted frog (*Rana luteiventris*) populations and habitat in northeastern Oregon. Journal of Herpetology 43:132–138.

Adger, N., P. Aggarwal, S. Agrawala, J. Alcamo, A. Allali, O. Anisimov, N. Arnell, M. Boko, . Canziani, T. Carter, G. Cassa, U. Confalonieri, R. Cruz, E. de Alba Alcaraz, W. Eastreling, . Field, A. Fischlin, B. Fitzharris, C.G. Garcia, C. Hanson, H. Harasawa, K. Hennessy, S. Huq, R. Jones, L. K. Bogataj, D. Karoly, R. Kliein, Z. Kundzewicz, M. Lal, R. Lasco, G. Love, X. Lu, G. Magrin, L.J. Mata, R. McLean, B. Menne, G. Midgley, N. Mimura, M.Q. Mirza, J. Moreno, L. Mortsch, I. Niang-Diop, R. Nichols, B. Novaky, L. Nurse, A. Nyon, M. Oppenheimer, J. Palutikof, M. Parry, A. Patwardhan, P. R. Lankao, C. Rosenzweig, S. Schneider, S. Semenov, J. Smith, J. Stone, J. van Ypersele, D. Vaughan, C. Vogel, T. Wilbanks, P. Wong, S. Wu, and G. Yohe. 2007. Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Climate Change 2007: Climate change impacts, adaptation and vulnerability. Brussels, Belgium.

Allen-Diaz, B., S.K. McIlroy, L.M. Roche, K.W. Tate, and A.J. Lind. 2010. Determining the effects of livestock grazing on Yosemite toads (*Bufo canorus*) and their habitat: final report to Forest Service Region 5. U.S. Forest Service, Vallejo, California.

Andrews, K.M., J.W. Gibbons, and D.M. Jochimsen. 2008. Ecological effects of roads on amphibians and reptiles: A literature review. Pages 121-143 *in* Mitchell, J.C., Brown, R.E.J., B. Bartholomew (editors). Urban Herpetology. Society for the Study of Amphibians and Reptiles.

Armour, C.A., D.A. Duff, and W. Elmore. 1994. The effects of livestock grazing on western riparian and stream ecosystems. Fisheries 19:9-12.

Bahls, P. 1992. The status of fish populations and management of high mountain lakes in the western United States. Northwest Science 66:183-193.

Bartelt, P.E. 1998. *Bufo boreas* (Western Toad) Mortality. Herpetological Review 29:96.

Beebee, T.J.C. 2013. Effects of Road Mortality and Mitigation Measures on Amphibian Populations. Conservation Biology 27:657–668.

Belsky, A.J., A. Matzke, and S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. Journal of Soil and Water Conservation. 54:419–431.

Berger, L., R. Speare, Daszak, D.E. Green, A.A., Cunningham, C.L. Goggin, R. Slocombe, M.A. Ragan, A.D. Hyatt, K.R. McDonald, H.B. Hines, L.R. Lips, G. Marantelli, and H. Parkes. 1998. Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. Proceedings of the National Academy of Sciences 95:9031-9036.

Biek, R., C. Funk, B.A. Maxell, and L.S. Mills. 2002. What is missing in amphibian decline research: insights from ecological sensitivity analysis. Conservation Biology 16:728–734.

Mr. Randy Moore

Blair, W.F. 1964. Evidence bearing on the relationships of the *Bufo boreas* group of toads. Texas Journal of Science 16:181–192.

_____. 1972. Evolution in the genus *Bufo*. University of Texas Press, Austin, Texas.

Blaustein, A.R., Walls, S.C., Bancroft, B.A., Lawler, J.J., Searle, C.L. and S.S. Gervasi. 2010. Direct and indirect effects of climate change on amphibian populations. Diversity 2:281-313.

Boyle, S.A., and F.B. Samson. 1985. Effects of non-consumptive recreation on wildlife. A review. Wildlife Society Bulletin 13:110-116.

Bradford, D.F. 1983. Winterkill, oxygen relations, and energy metabolism of a submerged dormant amphibian, *Rana muscosa*. Ecology 64:1171-1183.

_____. 1984. Temperature modulation in a high elevation amphibian, *Rana muscosa*. Copeia 1984(4):966–976.

_____. 1989. Allotopic distribution of native frogs and introduced fishes in high Sierra Nevada lakes of California: implication of the negative effect of fish introductions. Copeia 1989:775-778.

_____. 1991. Mass mortality and extinction in a high-elevation population of *Rana muscosa*. Journal of Herpetology 25:174-177.

Bradford, D.F., D.M. Graber, and F. Tabatabai. 1994. Population declines of the native frog, *Rana muscosa*, in Sequoia and Kings Canyon National Parks, California. Southwestern Naturalist 39:323-327.

Bradford, D.F., S.D. Cooper, T.M. Jenkins, K. Kratz, O. Sarnelle, and A.D. Brown. 1998. Influences of natural acidity and introduced fish on faunal assemblages in California alpine lakes. Canadian Journal of Fisheries and Aquatic Sciences 55(11):2478-2491.

Bradford, D.F., R.A. Knapp, D.W. Sparling, M.S. Nash, K.A. Stanley, N.G. Tallent-Halsell, L.L. McConnell, and S.M. Simonich. 2011. Pesticide distributions and population declines of California, USA alpine frogs, *Rana muscosa* and *Rana sierrae*. Environmental Toxicology and Chemistry 30:682-691.

Bradford, D.F., F. Tabatabai, and D.M. Graber. 1993. Isolation of remaining populations of the native frog, *Rana muscosa*, by introduced fishes in Sequoia and Kings Canyon National Parks, California. Conservation Biology 7:882-888.

Briggs, C.J., Knapp, R.A., and V.T. Vredenburg. 2010. Enzootic and epizootic dynamics of the chytrid fungal pathogen of amphibians. Proceedings of the National Academy of Science 107:9695–9700.

Brown, C., Hayes, M., Green, G., and D. Macfarlane. 2009. Yosemite Toad Conservation Assessment. DRAFT. 30 September, 2009.

_____. 2014. Mountain Yellow-legged Frog Conservation Assessment for the Sierra Nevada. DRAFT. 14 January 2014.

Mr. Randy Moore

Brown, C., K. Kiehl, and L. Wilkinson. 2012. Advantages of long-term, multi-scale monitoring: assessing the current status of the Yosemite toad (*Anaxyrus* [*Bufo*] *canorus*) in the Sierra Nevada, California, USA. Herpetological Conservation and Biology 7(2):115–131.

Brown, C., L. Wilkinson, and K. Kiehl. 2011. Status and trend of the mountain yellow-legged Frog, Yosemite toad and Pacific chorus frog in the Sierra Nevada, CA: Results from the First Monitoring Cycle of the USDA Forest Service Sierra Nevada Amphibian Monitoring Program DRAFT. Pinole, California.

Brown, C., Wilkinson, L., and K. Kiehl. 2014. Comparing the Status of two Sympatric Amphibians in the Sierra Nevada, California: Insights on Ecological Risk and Monitoring Common Species. Journal of Herpetology 48:74-83. 2014.

Bull, E.L., and M.P. Hayes. 2000. Effects of livestock on reproduction of the Columbia spotted frog. Journal of Range Management 53:291–294.

Burton, E.C., Gray, M.J., Schmutzer, A.C. and D.L. Miller. 2009. Differential responses of postmetamorphic amphibians to cattle grazing in wetlands. Journal of Wildlife Management 73:269–277.

Bury, R.B. 2004. Wildfire, fuel reduction, and herpetofaunas across diverse landscape mosaics in Northwestern forests. Conservation Biology 18:968-975.

California Climate Action Team. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. California Environmental Protection Agency, Sacramento, California.

California Department of Fish and Game (CDFG). 1994. Adoption of regulations for suction dredge mining. Amended Draft Environmental Impact Report. Rancho Cordova, California.

California Department of Fish and Wildlife. 2011. A status review of the mountain yellow-legged frog (*Rana sierrae* and *Rana muscosa*). Report to the Fish and Game Commission. California Department of Fish and Wildlife, Sacramento, California.

_____. 2014a. California Natural Diversity Data Base (CNDDB) RAREFIND. Natural Heritage Division, Sacramento, California.

_____. 2014b. BIOSIS. Natural Heritage Division, Sacramento, California.

California State Lands Commission. 1993. California's rivers: A public trust report. Sacramento, California.

Camp, C.L. 1916. Description of *Bufo canorus*, a new toad from Yosemite National Park. University of California Publications in Zoology 17:59–62.

Chapman, D.W. 1988. Critical review of variables used to define effects of fines in redds of large salmonids. Transactions of the American Fisheries Society 117:1-21.

Chaney, E., W. Elmore, and W.S. Platts. 1990. Livestock grazing on western riparian areas. U.S. Environmental Protection Agency and the Northwest Resource Information Center. Eagle, Idaho.

_____. 1917. Notes on the systematic status of the toads and frogs of California. University of California Publications in Zoology 17:115-125.

Cole, D.N. 1986. Recreational impacts on backcountry campsites in Grand Canyon National Park, Arizona, USA. Environmental Management 10:651-659.

Cole, D.N., and J.L. Marion. 1988. Recreation impacts in some riparian forests of the Eastern United States. Environmental Management 12:99-107.

Cole, D.N., and R.K. Fichtler. 1983. Campsite impact on three western wilderness areas. Environmental Management 7:275-288.

Cole, D.N., J.W. Van Wagtendonk, M.P. McClaran, P.E. Moore, and N. McDougald. 2004. Response of mountain meadows to grazing by recreational pack stock. Journal of Range Management 57:153-160.

Davidson, C. and Fellers, G.M. 2005. *Bufo canorus* Camp 1916, Yosemite Toad. Pages 400-401 *in*: Lannoo, M. (editor). Amphibian Declines: The Conservation Status of United States Species. University of California Press, Berkeley, California.

Davidson, C., H.B. Shaffer, and M.R. Jennings. 2002. Spatial tests of the pesticide drift, habitat destruction, UV-B, and climate-change hypotheses for California amphibian declines. Conservation Biology 16:1588-1601

Derlet, R.W. and J.R. Carlson. 2006. Coliform bacteria in Sierra Nevada wilderness lakes and streams: what is the impact of backpackers, pack animals, and cattle? Wilderness and Environmental Medicine 17:15-20.

Derlet, R.W., K.A. Ger, J.R. Richards, and J.R. Carlson. 2008. Risk factors for coliform bacteria in backcountry lakes and streams in the Sierra Nevada mountains: a 5-year study. Wilderness and Environmental Medicine 19:82-90.

Derlet, R.W., S.R. Goldman, and M.J. Connor. 2010. Reducing the impact of summer cattle grazing on water quality in the Sierra Nevada mountains of California: a proposal. Journal of Water and Health 2010.

Dodd, C.K. 2013a. Frogs of the United States and Canada. Volume 1. John Hopkins University Press. Baltimore, Maryland.

_____. 2013b. Frogs of the United States and Canada. Volume 2. John Hopkins University Press. Baltimore, Maryland.

Drost, C.A. and G. Fellers. 1996. Collapse of a regional frog fauna in the Yosemite area of the California Sierra Nevada, USA. Conservation Biology 10:414-425.

Feder, J.H. 1977. Genetic variation and biochemical systematics in western *Bufo*. Masters thesis, University of California, Berkeley, California.

Feldman, C.R., and J.A. Wilkinson. 2000. *Rana muscosa* (mountain yellow-legged frog). Predation. Herpetological Review 31:102.

Mr. Randy Moore

Fellers, G. M., D. F. Bradford, D. Platt, and L.L. Wood. 2007. Demise of repatriated populations of mountain yellow-legged frogs (*Rana muscosa*) in the Sierra Nevada of California. Herpetological Conservation and Biology 2:5-21.

Finlay, J.C., and V.T. Vredenburg. 2007. Introduced trout sever trophic connections in watersheds: consequences for a declining amphibian. Ecology 88(9):2187–2198.

Ford, L.D., P.A. Van Hoorn, D.R. Rao, N.J. Scott, P.C. Trenham, and J.W. Bartolome. 2013. Managing Rangelands to Benefit California Red-legged Frogs and California Tiger Salamanders. Alameda County Resource Conservation District, Livermore, California.

Garton, E.O., T.C. Foin, C. W. Bowen, J.M. Everingham, R. O. Schultz, and B. Holton, Jr. 1977. Quantitative studies of visitor impacts on environments of Yosemite National Park, California, USA and their implications for park management policy. Journal of Environmental Management 5:1-22.

Grasso, R.L.. R.M. Coleman, C. Davidson. 2010. Palatability and antipredator response of Yosemite toads (*Anaxyrus canorus*) to nonnative brook trout (*Salvelinus fontinalis*) in the Sierra Nevada mountains of California. Copeia 2010:457–462.

Green, D.E., and C. Kagarise Sherman. 2001. Diagnostic histological findings in Yosemite Toads (*Bufo canorus*) from a die-off in the 1970s. Journal of Herpetology 35:92-103.

Green, D.M., L.A. Weir, G.S. Casey, and M.J. Lannoo. 2014. North American amphibians distribution and diversity. University of California, Berkeley, California.

Grinnell, J. and T.I. Storer. 1924. Animal life in Yosemite: an account of the mammals, birds, reptiles, and amphibians in a cross-section of the Sierra Nevada. University of California Press. Berkeley, California.

Harvey, B.C., and T.E. Lisle. 1998. Effects of suction gold dredging on streams: A review and evaluation strategy. Fisheries 23:8-17.

Haugen G., D. Duff. 1982. The Best Management Practices for the Management and Protection of Western Riparian Ecosystems. Riparian habitat committee, Western Division American Fisheries Society.

Heller, C.L. 1960. The Sierra yellow-legged frog. Yosemite Nature Notes 39(5):126–128.

Hossack, B. R., and D. S. Pilliod. 2011. Amphibian responses to wildfire in the western United States- Emerging patterns from short-term studies. Fire Ecology 7(2):129-144.

Hossack, B.R., W.H. Lowe, and P.S. Corn. 2012. Rapid increases and time-lagged declines in amphibian occupancy after wildfire. Conservation Biology 27:219–228.

Hossack, B.R., L.A. Eby, C.G. Guscio, and P.S. Corn. 2009. Thermal characteristics of amphibian microhabitats in a fire-disturbed landscape. Forest Ecology and Management 258: 1414–1421.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game. Rancho Cordova, California

Jansen, A., and M. Healey. 2003. Frog communities and wetland condition: relationships with grazing by domestic livestock along an Australian floodplain river. Biological Conservation 109:207–219.

Jenkins, T.M. 1994. Aquatic biota in the Sierra Nevada: current status and potential effects of acid deposition on populations. Final Report Contract A932-138. California Air Resources Board, Sacramento.

Kagarise, Sherman, C. 1980. A comparison of the natural history and mating system of two anurans: Yosemite toads (*Bufo canorus*) and black toads (*Bufo exsul*). PhD dissertation, University of Michigan, Ann Arbor, Michigan.

Kagarise, Sherman, C.K.; Morton, M.L. 1984. The toad that stays on its toes. Natural History. 93: 72-78.

Kagarise, Sherman, C. and M.L. Morton. 1993. Population declines of Yosemite toads in the eastern Sierra Nevada of California. Journal of Herpetology 27:186–198.

Karlstrom, E.L. 1962. The toad genus *Bufo* in the Sierra Nevada of California: ecological and systematic relationships. University of California Publications in Zoology 62:1–104.

Karlstrom, E.L., and R.L. Livezey. 1955. The eggs and larvae of the Yosemite toad *Bufo canorus* Camp. Herpetologica 11:221-227.

Kattelmann, R. 1996. Hydrology and water resources. Volume II chapter 30 *in*: Sierra Nevada Ecosystem Project: Final report to Congress. Centers for Water and Wildland Resources, University of California, Davis, California.

Kattelmann, R., and M. Embury. 1996. Riparian Areas and Wetlands. In: Sierra Nevada ecosystem project, final report to Congress. University of California, Davis, Calfornia.

Kauffman, J.B., and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications a review. Journal of Range Management 37(5):430-437.

Kauffman, J.B., W.C. Krueger, and M. Vavra. 1983. Impacts of cattle on streambanks in Northeastern Oregon. Journal of Range Management 683–685.

Knapp R.A. 2005a. Results of amphibian resurveys in Sequoia-Kings Canyon National Park. Unpublished Interim Report. Sierra Nevada Aquatic Research Laboratory, Mammoth Lakes, California.

_____. 2005b. Effects of nonnative fish and habitat characteristics on lentic herpetofauna in Yosemite National Park, USA. Biological Conservation 121:265-279

Knapp, R.A., D.M. Boiano, and V.T. Vredenburg. 2007. Removal of nonnative fish results in population expansion of a declining amphibian (mountain yellow-legged frog, *Rana muscosa*). Biological Conservation 135:11-20

Knapp, R.A., and K.R. Matthews. 2000a. Non-native fish introductions and the decline of the mountain yellow-legged frog from within protected areas. Conservation Biology 14:428-438.

_____. 2000b. Effects of non-ative fishes on wilderness lake ecosystems in the Sierra Nevada and recommendations for reducing impacts. USDA Forest Service Proceedings RMRS-P-15-Vol-5.

Knapp, R.A., K.R. Matthews, and O. Sarnelle. 2001. Resistance and resilience of alpine lake fauna to fish introductions. Ecological Monographs 71:401–421.

Knapp, R.A., K.R. Matthews, H.K. Preisler, and R. Jellison. 2003. Developing probabilistic models to predict amphibian site occupancy in a patchy landscape. Ecological Applications 13:1069–1082.

Knight, R.L., and D.N. Cole. 1991. Effects of recreational activity on wildlife in wildlands. Transactions of the 56th North American Wildlife and Natural Resources Conference 56:238-247.

Knutsen, M.G., W.B. Richardson, and D.M. Reineke. 2004. Agricultural Ponds Support Amphibian Populations. Ecological Applications 14:669–684.

Lacan, I., K. Matthews, and K. Feldman. 2008. Interaction of an introduced predator with future effects of climate change in the recruitment dynamics of the imperiled Sierra Nevada yellow-legged frog (*Rana sierrae*). Herpetological Conservation and Biology 3:211–223.

Lannoo, M.J. (Editor). 2005. Amphibian declines the status and conservation of United States species. University of California Press, Berkeley, California.

Larson, D.J. 1996. Historical water-use priorities and public policies. Pages 163-185 *in* Sierra Nevada Ecosystem Project: Final report to Congress Volume II. Centers for Water and Wildland Resources Report. University of California, Davis, California.

Lefcort, H., K.A. Hancock, K.M. Maur, and D.C. Rostal. 1997. The effects of used motor oil, silt and the water mold *Saprolegnia parasitica* on the growth and survival of mole salamanders (genus *Ambystoma*). Archives of Environmental Contamination and Toxicology 32:383-388.

Liang, C.T. 2010. Habitat modeling and movements of the Yosemite toad (*Anaxyrus* (= *Bufo*) *canorus*) in the Sierra Nevada, California. PhD dissertation. University of California, Davis California.

Liang, C.T., S.L. Barnes, H. Eddinger, and A.J. Lind. 2010. Species distribution model of the Yosemite toad in the Sierra National Forest, California. USDA Forest Service, Pacific Southwest Research Station, Sierra Nevada Research Center, Davis, California. Report to U.S. Fish and Wildlife Service. Sacramento, California.

Liang, C.T., and T.J. Stohlgren. 2011. Habitat suitability of patch types: A case study of the Yosemite toad. Frontiers in Earth Sciences 5: 217-228.

Lind, A., R. Grasso, J. Nelson, K. Vincent, C. Liang, K. Tate, L. Roche, B. Allen-Diaz, and S. Mcilroy. 2011. Determining the Effects of Livestock Grazing on Yosemite Toads (*Anaxyrus* [*Bufo*] *canorus*) and Their Habitat: An Adaptive Management Study. Pacific Southwest Research Station, Sierra Nevada Research Center, Davis, California.

Livezey, R.L., and A.H. Wright. 1945. Descriptions of four salientian eggs. American Midland Naturalist 34:701–706.

Longcore, J. E., A.P. Pessier, and D.K. Nichols. 1999. *Batrachochytrium dendrobatidis* gen. et sp. nov., a chytrid pathogenic to amphibians. Mycologia 91:219–227.

Macey, J.R., J. Strasburg, J. Brisson, V.T. Vrendenburg, M. Jennings, and A. Larson. 2001. Molecular phylogenetics of western North American frogs of the *Rana boylii* species group. Molecular Phylogenetics and Evolution 18:131-143.

Mahaney, P.A. 1994. The effects of freshwater petroleum contamination on amphibian hatching and metamorphosis. Environmental Toxicology 13:259-265.

Mao, J., D.E. Green, G. Fellers, and V.G. Chinchat. 1999. Molecular characterization of iridioviruses isolated from sympatric amphibians and fish. Virus Research 63:45-52.

Marlow, C.B. and T.M. Pogacnik. 1985. Time of grazing and cattle-induced damage to streambanks. Paper presented at the North American Riparian Conference. University of Arizona, Tucson, Arizona.

Martin, D.L. 1992. Sierra Nevada anuran survey: an investigation of amphibian population abundance in the national forests of the Sierra Nevada of California. Report to U.S. Forest Service. Canorus Ltd., Sacramento, California.

_____. 2008. Decline, movement, and habitat utilization of the Yosemite toad (*Bufo canorus*): An endangered anuran endemic to the Sierra Nevada of California. PhD dissertation. University of California, Santa Barbara, California.

Matthews, K.R., and H.K. Preisler. 2010. Site fidelity of the declining amphibian *Rana sierrae* (Sierra Nevada yellow-legged frog). Canadian Journal of Fisheries and Aquatic Science 67:243-255.

Mazerolle, M.J., M. Huot, and M. Gravel. 2005. Behavior of amphibians on the road in response to car traffic. Herpetologica 61:380-388.

McIlroy, Susan K., A. Lind, B. Allen-Diaz, L. Roche, W. Frost, R. Grasso, and K. Tate. 2013. Determining the effects of cattle grazing treatments on Yosemite toads (*Anaxyrus* [=Bufo] *canorus*) in montane meadows. PLoS ONE 8(11):79263.

McMenamin, S.K., E.A. Hadlya, and C.K. Wright. 2008. Climatic change and wetland desiccation cause amphibian decline in Yellowstone National Park. Proceedings of the National Academy of Sciences 105:16988–16993.

Meehan, W.R. and W.S. Platts. 1978. Livestock grazing and the aquatic environment. Journal of Soil and Water Conservation 6:274–278.

Menke, J.W, C. Davis, and P. Beesley. 1996. Rangeland assessment. In: Sierra Nevada ecosystem project, final report.

Moore, P.E., D.N. Cole, J.W. Wagtendonk, M.P. McClaran, and N. McDougald. 2000. Meadow response to pack stock grazing in the Yosemite wilderness: integrating research and management. In: Wilderness ecosystem, threats, and management, Volume 5. RMRS-P-15-

VOL-5; Proceedings of the Wilderness science in a time of change conference, 23-27 May 1999. Missoula, Montana. USDA Forest Service, Rocky Mountain Research Station: 160–164.

Morton, M.L., and M.E. Pereyra. 2010. Habitat use by Yosemite toads: life history traits and implications for conservation. Herpetological Conservation and Biology 5:388-394.

Morton, M.L., and K.N. Sokolski. 1978. Sympatry in *Bufo boreas* and *Bufo canorus* and evidence of natural hybridization. Bulletin of the Southern California Academy of Science 77:52–55.

Moyle, P.B., R.M. Yoshiyama, and R.A. Knapp. 1996. Status of fish and fisheries. Pages 953-973 *in* Sierra Nevada Ecosystem Project: final report to Congress. Volume II. Centers for Water and Wildland Resources, University of California, Davis, California.

Mullally, D.P. 1953. Observations on the ecology of the toad *Bufo canorus.* Copeia 1953:182-183.

_____. 1956. The relationships of the Yosemite and western toads. Herpetologica 12:133–135.

Mullally, D.P., and J.D. Cunningham. 1956. Ecological relations of *Rana muscosa* at high elevations in the Sierra Nevada. Herpetologica 12:189–198.

Nelson, R.L., M.L. McHenry, and W.S. Platts. 1991. Mining Pages 425-457 *in* W.R. Meehan (Editor). Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats. American Fisheries Society Special Publication 19:425-457.

Newcombe, C.P., and D.D. MacDonald. 1991. Effects of suspended sediments on aquatic ecosystems. North American Journal of Fisheries Management 11:72-84.

Obedzinski, R.A., C.G. Shaw III, and D.G. Neary. 2001. Declining woody vegetation in riparian ecosystems of the western United States. Western Journal of Applied Forestry 16:169–180.

Olson, D.H. 1989. Predation on breeding western toads (*Bufo boreas*). Copeia 1989:391–397.

Olson-Rutz, K.M., C.B. Marlow, K. Hansen, L.C. Gagnon, and R.J. Rossi. 1996a. Packhorse grazing behavior and immediate impact on a timberline meadow. Journal of Range Management 49(6):546-550.

_____. 1996b. Recovery of a high elevation plant community after packhorse grazing. Journal of Range Management 49(6):541-545.

Ott, A.G. 1985. Fish Protection and Placer Mining. Alaska Fish and Game March-April 1985.

Point Reyes Bird Observatory. 2011. Projected effects of climate change in California: Ecoregional summaries emphasizing consequences for wildlife. Point Reyes Bird Observatory Conservation Science, Petaluma, California.

Pope, K. 1999. *Rana muscosa* (mountain yellow-legged frog): Diet. Herpetological Review 30(3): 163–164.

Pope, K.L., and K.R. Matthews. 2001. Movement ecology and seasonal distribution of mountain yellow-legged frogs, *Rana muscosa*, in a high-elevation Sierra Nevada basin. Copeia 2001:7 87-793.

Power, M. E. 1990. The importance of sediment in the grazing ecology and size class interactions of an armored catfish, *Aneistrus spinosus*. Environmental Biology of Fish 10:173-181.

Rachowicz, L.J., R.A. Knapp, and J.A.T. Morgan. 2006. Emerging infectious disease as a proximate cause of amphibian mass mortality. Ecology 87:1671–1683.

Ratliff, R.D. 1985. Meadows on the Sierra Nevada of California: state of knowledge. General Technical Report. PSW-84, Pacific Southwest Forest and Range Experiment Station. U.S. Forest Service, Pinole, California.

Roche, L.M., B. Allen-Diaz, D.J. Eastburn, and K.W. Tate. 2012a. Cattle grazing and Yosemite toad (*Bufo canorus* Camp) breeding habitat in Sierra Nevada meadows. Rangeland Ecology and Management 65:56–65.

Roche, L.M., A.M. Latimer, D.J. Eastburn, and K.W. Tate. 2012b. Cattle grazing and conservation of a meadow-dependent amphibian species in the Sierra Nevada. PLoS ONE 7:35734.

Rodríguez-Prieto, I., and E. Fernández-Juricic. 2005. Effects of direct human disturbance on the endemic Iberian frog *Rana iberica* at individual and population levels. Biological Conservation 123:1–9.

Sadinski, W.J. 2004. Amphibian declines: Causes. Final report to The Yosemite Fund.

Schlumpf, M., B. Cotton, M. Conscience, V. Haller, B. Steinmann, and W. Lichtensteiger. 2001. In vitro and in vivo estrogenicity of UV screens. Environmental Health Perspectives 109:239-244.

Shaffer M.L. 1981. Minimum population sizes for species conservation. Bioscience 31:131–134.

Shaffer, H.B., G.M. Fellers, A. Magee, and R. Voss. 2000. The genetics of amphibian declines: population substructure and molecular differentiation in the Yosemite toad, *Bufo canorus*, (Anura, Bufonidae) based on single strand conformation polymorphism analysis (SSCP) and mitochondrial DNA sequence data. Molecular Ecology 9:245–257.

Skerratt, L.F., L. Berger, R. Speare, S. Cashins, K.R. McDonald, A.D. Phillott, H.B. Hines, and N.Kenyon. 2007. Spread of chytridiomycosis has caused the rapid global decline and extinction of frogs. EcoHealth 4:125–134.

Stebbins, R.C. 1951. Amphibians of western North America. University of California Press. Berkeley, California.

_____. 2003. A field guide to western reptiles and amphibians. Houghton Mifflin. Boston, Massachusetts.

Stebbins, R.C. and N.W. Cohen. 1995. A natural history of amphibians. Princeton University Press, Princeton, New Jersey.

Stebbins, R.C. and S.M. McGinnis. 2012. Field guide to amphibians and reptiles of California. University of California Press. Berkeley, California.

Stephens, M.R. 2001. Phylogeography of the *Bufo boreas* (Anura, Bufonidae) species complex and the biogeography of California. Masters thesis, Sonoma State University. Santa Rosa, California.

Stice, M.J., and C.J. Briggs. 2010. Immunization is ineffective at preventing infection and mortality due to the amphibian chytrid fungus *Batrachochytrium dendrobatidis*. Journal of Wildlife Diseases 46:70-77.

Stohlgren, T.J., and D.J. Parsons. 1986. Vegetation and soil recovery in wilderness campsites closed to visitor use. Environmental Management 10:375-380.

Storer, T.I. 1925. A synopsis of the Amphibia of California. University of California Publications in Zoology 27.

Stuart, J.M., M.L. Watson, T.L. Brown, and C. Eustice. 2001. Plastic netting: an entanglement hazard to snakes and other wildlife. Herpetological Review 32(3):162-164.

U.S. Fish and Wildlife Service. 2014. Endangered and threatened wildlife and plants; Endangered status for the Sierra Nevada yellow-legged frog and the northern district population segment of the mountain yellow-legged frog, and threatened status for the Yosemite toad. **Federal Register** 79:24256-245310.

_____. 2016. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Sierra Nevada Yellow-Legged Frog, the Northern DPS of the Mountain Yellow-Legged Frog, and the Yosemite Toad; Final Rule. **Federal Register** 81:59046-59119.

U.S. Forest Service (USFS). 2001a. Fisheries Programmatic Biological Evaluation for Selected Mining Related Activities and Westslope Cutthroat Trout. Helena, Lincoln, and Townsend Ranger Districts.

_____. 2001b. Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement.

_____. 2004. Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement, Volume 1. U.S. Forest Service.

_____. 2012. Aquatic Species Biological Assessment and Biological Evaluation for the Kaiser Range Grazing Allotment. High Sierra Ranger District, Sierra National Forest, Fresno County, California.

_____. 2013a. Aquatic Species Biological Assessment and Biological Evaluation for the Bald Mountain Project (Ecological Restoration and Fuels Reduction). High Sierra Ranger District, Sierra National Forest, Fresno County, California.

_____. 2013b. Lake Tahoe Basin Management Unit Biological Assessment: Land and Resource Management Plan Revision Final Environmental Impact Statement.

_____. 2014. BEH Rangeland Allotments, Draft Environmental Impact Statement, R5-MB-245. Stanislaus National Forest, Sonora, California.

_____. 2014. Natural Resource Information System. Vallejo, California.

U. S. Forest Service (USFS), California Department of Fish and Game, National Park Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey. 2015. Yosemite Toad Conservation Assessment.

U.S. Global Change Research Program. 2013. Federal Advisory Committee draft climate assessment report. Washington, D.C.

Vale, T.R. 1987. Vegetation change and park purposes in the high elevations of Yosemite National Park, California. Annals of the Association of American Geographers 77(1):1-18.

Vankat, J.L., and J. Major. 1978. Vegetation changes in Sequoia National Park, California. Journal of Biogeography 5:377-402.

Voyles J., L. Berger, S. Young, R. Speare, and R. Webb. 2007. Electrolyte depletion and osmotic imbalance in amphibians with chytridiomycosis. Diseases of Aquatic Organisms 77:113-118.

Voyles, J., S. Young, L. Berger, C. Campbell, and W.F. Voyles. 2009. Pathogenesis of chytridiomycosis, a cause of catastrophic amphibian declines. Science 326:582-585.

Vredenburg, V. T. 2000. Natural history notes: *Rana muscosa* (mountain yellow-legged frog), conspecific egg predation. Herpetological Review 31:170-171.

_____. 2004. Reversing introduced species effects: experimental removal of introduced fish leads to rapid recovery of a declining frog. Proceedings of the National Academy of Sciences 101:7646–7650.

Vredenburg, V.T., R. Bingham, R. Knapp, J.A.T. Morgan, C. Moritz, and D. Wake. 2007. Concordant molecular and phenotypic data delineate new taxonomy and conservation priorities for the endangered mountain yellow-legged frog. Journal of Zoology 271:361–374.

Vredenburg, V.T., G. Fellers, and C. Davidson. 2005. The mountain yellow-legged frog *Rana muscosa* (Camp 1917). Pages 563-566 *in* Lannoo, M. (editor). Status and conservation of US amphibians. University of California Press, Berkeley, California.

Vredenburg, V.T., R. Knapp, T.S. Tunstall, and C. Briggs. 2010. Dynamics of an emerging disease drive large-scale amphibian population extinctions.

Vredenburg, V., T. Tunstall, R. Bingham, J. Yeh, S. Schoville, C. Briggs, and C. Moritz. 2004. Patterns of habitat use and movement of *Rana muscosa* in the northern Sierra Nevada with comparisons to populations in the southern Sierra Nevada, with additional information on the biogeography of the species. Final Report for California Department of Fish and Game, Habitat Conservation Planning Group and the USDA Forest Service.

Wagoner, L. 1886. Report on forests of the counties of Amador, Calaveras, Tuolumne, and Mariposa. First biennial report of the California State Board of Forestry for the years 1885-1886. State Board of Forestry, Sacramento, California.

Walls, S.C., W.J. Barichivich, and M.E. Brown. 2013. Drought, Deluge and Declines: The Impact of Precipitation Extremes on Amphibians in a Changing Climate. Biology 2:399-418.

Wang, I.J. 2012. Environmental and topographic variables shape genetic structure and effective population sizes in the endangered Yosemite toad. Diversity and Distributions 18:1033–1041.

Weixelman, D. A., B. Hill, D.J. Cooper, E.L. Berlow, J.H. Viers, S.E. Purdy, A.G. Merrill, and S.E. Gross. 2011. A Field Key to Meadow Hydrogeomorphic Types for the Sierra Nevada and Southern Cascade Ranges in California. General Technical Report R5-TP-034.

Wengert, G. 2008. Habitat Use, home range, and movements of mountain yellow-legged frogs (*Rana muscosa*) in Bean and Spanish Creeks on the Plumas National Forest. Final Report to the Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service. Sacramento, California.

Wright, A.H., and A.A. Wright. 1949. Handbook of frogs and toads. Comstock Publishing, Ithaca, New York.

Zeiner, D. C., W.F. Laudenslayer, and K.E. Mayer. 1988. California's wildlife. Volume I: amphibians and reptiles. California Department of Fish and Game, Sacramento, California.

Zweifel, R.G. 1955. Ecology, distribution, and systematics of frogs of the *Rana boylei* group. University of California Publications in Zoology 54:207-292.

September 22, 2017

The Honorable John Barrasso
Chairman
Environment and Public Works Comm.
U.S. Senate
410 Dirksen Senate Office Bldg.
Washington, D.C. 20510

The Honorable Thomas R. Carper
Ranking Member
Environment and Public Works Comm.
U.S. Senate
456 Dirksen Senate Office Bldg.
Washington, D.C. 20510

Dear Chairman Barrasso and Ranking Member Carper:

I am writing to share my views on eastern National Forest management issues in relation to the Senate Environment and Public Works Committee's review of S. 1731, the Forest Management Improvement Act of 2017, sponsored by Senator Thune. I am deeply concerned about key provisions of this legislation. In my opinion, S. 1731 is fundamentally inconsistent with ecologically sound management of the eastern National Forests and should not be approved by your committee or become law. Please include my letter in the record of your committee hearing on September 27.

I am currently a professor emeritus in ecology at Duke University's Nicholas School of the Environment, where I served as founding dean from 1991 to 2001. I am a past president of the Ecological Society of America and was elected a Fellow of the ESA in 2013. I was also chosen to be a Fellow of the American Association for the Advancement of Science in 1993. I received my Ph.D. from the University of California at Santa Barbara in 1973. During my professional career, I have specialized in sustainable forest management, wildfire management, and the impact of disturbance and succession in forest ecosystems.

Covering 25 million acres in 29 different states and Puerto Rico, the eastern National Forests are unique compared to their western counterparts. They represent a smaller portion of the total landscape, and individual forests are more island-like in their distribution across the region. Most were incorporated into the National Forest System under the Weeks Act of 1911, which aimed at restoring lands degraded by two centuries of past human activities including logging and agriculture. Thus, restoration has been a major theme in the management of each of these forests, and they have changed significantly over the past century. As such, a diverse array of successional stages (from early seral to mature, late successional forest) is now represented in each forest. Nevertheless, late successional and old-growth forests are generally under-represented in the landscape mix of eastern forests.

NICHOLAS SCHOOL
OF THE ENVIRONMENT
DUKE UNIVERSITY
forging a sustainable future

A central feature of S. 1731 is the creation of numerous new "Categorical Exclusions" (CEs) from the National Environmental Policy Act for particular projects or management situations. A CE allows the Forest Service to exempt environmentally insignificant management activities from the normal NEPA process, most notably from the necessity of a formalized program for public input and environmental review. Putting aside for the moment which projects or management situations, it is important to ask: under what circumstances ought CEs to be allowed?

National Forests are public lands managed for a variety of services that benefit many different public stakeholders. The intent of NEPA is to ensure that all relevant stakeholders have a voice in management decisions that affect their legitimate interests. It is also the intent of NEPA that a reasonable range of management alternatives be considered to mitigate conflicting interests where possible.

The variety of public interests in eastern National Forests is particularly diverse given their scattered distribution and location near metropolitan areas. Those interests include watershed management (for both water quantity and quality), recreation, hunting, fishing, and biodiversity protection, as well as provision of wood fiber.

In the eastern National Forests, CEs might be appropriate for small areas such as individual stands at the scale of tens to a few hundred acres, or in cases of emergency such as pest management or wildfire remediation to protect critical resources (e.g., watershed issues). In those cases, CEs should be located and bounded so as to align with the scale of natural disturbance processes unique to the landscape of each forest (i.e., no one size fits all). During project planning, the Forest Service should take into account the range of management and forest conditions on the landscape in which they are embedded. Furthermore, projects should be consistent with all laws relevant to the management of National Forests, including the Endangered Species Act and the National Forest Management Act, and they should protect areas of special value such as late successional/old growth forest and roadless areas.

S. 1731 would create new CEs up to 10,000 acres (roughly 15 square miles) in size for various types of projects and situations, including salvage logging, creation of early seral forest habitat, and commercial thinning. The bills would also exempt Forest Service from analyzing the cumulative environmental effects of multiple CE projects. These provisions violate fundamental ecological principles of sound public forest management relating to issues of scale, context, and need.

Specific to the issue of scale, 10,000 acres is excessively large for CEs under most circumstances, particularly on the landscapes of most eastern National Forests. This scale is far larger (20-50x) than the scale of natural disturbance processes (fire, wind, disease) on most

NICHOLAS SCHOOL
OF THE ENVIRONMENT
DUKE UNIVERSITY
forging a sustainable future

eastern landscapes, and is far larger than the historic land use mosaic that defines the distribution of forest stands in many eastern forests. Management decisions at this scale are likely to influence the interests of a variety of stakeholders who justifiably should have input into decisions.

Specific to the issue of context, all CE decisions should be made with a complete understanding of the landscape within which they are embedded. To ignore this principle will virtually guarantee undesirable cumulative effects across the landscape. In other words, it should not be possible to manage an entire landscape by simply creating a checkerboard of CEs.

Specific to the issue of need, most of the motivations for the creation of CEs listed in the Thune bill do not qualify as emergency situations, and all have important implications for different stakeholders. Creation of seral habitat and wildlife habitat improvement should always be planned with input from qualified biologists and interested stakeholders, including state and tribal wildlife agencies. Commercial thinning should be done in the context of forest plans and executed at ecologically relevant scales. Salvage logging of dead and/or dying trees should also be done at ecologically relevant scales and avoided altogether in areas needed to preserve natural ecosystem processes.

In conclusion, I strongly urge the Committee not to short-cut the NEPA process in National Forest management – especially in the eastern National Forests. These are public forests and the public should be fully engaged in the management decisions of the kinds and at the scale proposed under S. 1731.

Sincerely,

Norman L. Christensen, Ph.D.
Founding Dean and Professor Emeritus

Alaska Wilderness League * American Bird Conservancy
Center for Biological Diversity * Defenders of Wildlife
Earthjustice * Earthworks * Endangered Species Coalition
Environmental Protection Information Center * International League for Animal Welfare *
Klamath Forest Alliance *Los Padres ForestWatch
Natural Resources Defense Council * Sierra Club
Southern Environmental Law Center * Western Environmental Law Center

PLEASE OPPOSE
THE "LITIGATION RELIEF FOR FOREST MANAGEMENT PROJECTS ACT,"
A THREAT TO ENDANGERED SPECIES AND PUBLIC LANDS

The Litigation Relief for Forest Management Projects Act (S. 605/H.R. 1483) poses a serious and precedential threat to imperiled species. The bill would remove the obligation of the Forest Service and the Bureau of Land Management (BLM) to conduct consultation under the Endangered Species Act (ESA) when species are newly listed or critical habitat is newly designated and raises a host of concerns.

IGNORES CUMULATIVE HARM TO ENDANGERED SPECIES FOR DECADES
Specifically, the bill allows the Forest Service and BLM to delay for years, possibly even decades, plan-level consultation for newly listed endangered species or critical habitat.

- ESA Section 7 consultations have been critical to the protection of imperiled species for over 40 years. Consultation is the Act's mechanism for making sure that action agencies account for the full impact of their actions and discharge their duty to avoid contributing to extinction. Two interconnected layers of ESA consultation, at the plan and project level, work in concert to protect species and their critical habitat.

- Plan-level consultations evaluate the cumulative effects of a federal program, such as multiple timber harvest projects over a decade, on a species or critical habitat, whereas project-level consultations only examine the narrow effects of a single federal action. Plan-level consultations can identify threats to species that are not detectable at the project level. Forgoing plan-level consultations thus risks approving a project that unknowingly jeopardizes a listed species or harms its habitat. By facilitating this ultimate death by a thousand cuts scenario, the bill is likely to result in greater harm to species and possibly foreclose their recovery opportunities.

- S. 605 would allow for oil and gas, mining, timber and other harmful development projects to proceed for years without vital ESA consultations across hundreds of millions of acres of national forest and BLM lands.

IMPACTS OIL AND GAS DEVELOPMENT ON PUBLIC LANDS
The bill purports to be about forest management, but it also waives re-initiation of consultation on land management plans governing oil and gas development across hundreds of millions of acres of BLM and Forest Service lands.

- In the oil and gas permitting process, plan-level consultation provides the only meaningful opportunity for experts at the U.S. Fish and Wildlife Service (FWS) to review the landscape-scale implications of oil and gas development impacts to endangered species and to set habitat aside for listed species prior to a lease sale, at which point the company gains a legal right to extract the oil and gas.

- "Project-level" consultation for oil and gas drilling operations is woefully insufficient to safeguard listed species and their habitat. In practice, it is often a formality because it occurs after the transfer of drilling rights to the developer, leaving the government with limited ability to meaningfully alter the project to protect listed species and their habitat.

EXEMPTS SOME ACTIVITES FROM ANY ESA CONSULTATION FOR DECADES
S. 605 waives plan-level consultation even when activities have no project level consultation "backstop". The legislation only provides for a project-level consultation for activities already subject to project-level consultation requirements.

- Some activities under forest plans or BLM plans occur without any project-level review or approval. Once the initial plan level consultation takes place and a plan is approved, the activity moves forward without any further assessment. Until the entire management plan is revisited, the government will ignore all impacts of the activity on newly listed species or critical habitat.

UNNECESSARILY UNDERMINES SPECIES RECOVERY AND MAKES IT MORE EXPENSIVE
For newly listed species or new critical habitat designations, S. 605 allows plan-level consultations to be delayed until management plans are formally revised. This upends what is often a routine and non-controversial consultation that can be extremely meaningful, especially for species that have long awaited listing. It can close off recovery options as incidental take permits at the project level to allow habitat and individual takes are issued without regard to their cumulative impacts, undermining recovery.

- Due to a lack of funding for the listing process species now wait an average of 12 years to receive ESA listing protections. Under this legislation, a species that waited more than a decade to be listed could then be required to wait another decade, or more, before the relevant land management plans accounts for the listing. S. 605 unnecessarily delays help for these species by unduly delaying a consultation program that can help.

- The western Yellow-billed cuckoo is a prime example of why this bill is unnecessary and extreme. First identified in 1982 as a species that may need ESA protection, it wasn't until 32 years later (2014) that it finally gained protection under the Act. Forests in the Southwest where Yellow-billed cuckoos occur are many years behind in updating their forest plans but, under current law, they have successfully completed plan-level consultation for the bird without controversy.

- The bill is likely to increase the difficulty and cost of species recovery over time if species that have waited years for ESA protection face piecemeal consideration as forest plans come up for review one forest at a time and even that takes years.

- Timely cumulative impacts analysis are needed to determine if the impacts of a project are significant enough to tip a species over the edge into a situation where recovery becomes extremely costly or physically impossible because the needed habitat has been irreversibly altered. Without a cumulative assessment, the Service could continue to authorize incidental take for a species without recognizing the point at which jeopardy or adverse modification of critical habitat has been exceeded.

- The consultation process under the ESA has also been developed and honed over many years, and can be conducted in a timely and efficient manner. The Forest Service, BLM and the FWS routinely engage in consultation on plans when they are adopted, and know how to re-initiate

consultation on new listings with little to no disruption of ongoing actions. In June, for example, the Forest Service and Fish and Wildlife Service completed a *Cottonwood*-type consultation in just 10 days on nine national forests in the Sierra Nevada region following the designation of critical habitat for the Yosemite toad and Sierra Nevada and mountain yellow-legged frogs.

UNDERMINES EFFICIENCY AND DELAYS PROJECT LEVEL REVIEW

The legislation's elimination of plan-level consultation is more likely to delay project approval than expedite it.

- Engaging in ESA consultation at the land management plan level leads to more efficient and effective project-level consultations. A recent peer-reviewed study on FWS consultations found that the median recorded length of formal consultations was 62 days for projects *without* plan-level consultations and 24 days for projects *with* plan-level review[2] In other words, projects move two and half times faster with the benefit of programmatic consultation.

- Rather than re-analyzing effects to listed species with each new project, plan level consultation allows agencies to establish a broad-scale environmental baseline of current conditions for listed species that can be applied, with necessary modification, to site-specific projects.

[2] Malcom, J.W. and Y. Li. 2015. Data contradict common perceptions about a controversial provision of the US Endangered Species Act. Proceedings of the National Academy of Sciences of the United States of America. 112:52. 14844-14849.

September 25, 2017

The Honorable John Barrasso
Chairman
Environment and Public Works Comm.
U.S. Senate
410 Dirksen Senate Office Bldg.
Washington, D.C. 20510

The Honorable Thomas R. Carper
Ranking Member
Environment and Public Works Comm.
U.S. Senate
456 Dirksen Senate Office Bldg.
Washington, D.C. 20510

RE: S. 1731 – OPPOSE

Dear Chairman Barrasso and Ranking Member Carper:

The Wilderness Society strongly opposes S. 1731, the "Forest Management Improvement Act of 2017," introduced by Senator Thune. S. 1731 would permit logging of vast areas of National Forest System land with virtually no public involvement, environmental analysis, or assurance that environmental laws will be followed. We respectfully request that this letter be included in the Committee's hearing record for the September 27, 2017 "Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions."

Reducing Public Involvement in National Forest Management through New and Expanded Categorical Exclusions

Section 3 of S. 1731 would exempt several types of national forest logging projects up to 10,000 acres (15.6 square miles) in size from the public involvement and environmental analysis requirements of the National Environmental Policy Act (NEPA). Specifically, the bill would create four new legislative Categorical Exclusions (CEs) from NEPA:

- *Logging to create early seral habitat.* This CE could allow up to 10,000 acres of clearcutting to occur with no analysis of the environmental consequences and very limited public involvement. The size of this CE is orders of magnitude larger than the ecologically appropriate size of created wildlife habitat openings.
- *Logging to improve wildlife habitat.* This provision is unnecessary because the Forest Service already has an administrative CE for wildlife habitat improvement projects.[1] If the legislative CE in S. 1731 replaced the agency's existing CE in 36 CFR 220.6(e)(6), it could allow the Forest Service to spray herbicides and build

[1] See 36 CFR 220.6(e)(6), which provides a categorical exclusion for "timber stand and/or wildlife habitat improvement activities that do not include the use of herbicides or do not require more than 1 mile of low standard road construction. Examples include, but are not limited to:

(i) Girdling trees to create snags;
(ii) Thinning or brush control to improve growth or to reduce fire hazard including the opening of an existing road to a dense timber stand;
(iii) Prescribed burning to control understory hardwoods in stands of southern pine; and
(iv) Prescribed burning to reduce natural fuel build-up and improve plant vigor."

an unlimited amount of road as part of habitat improvement projects, with scant public notice or environmental analysis.

- *Commercial thinning on timberland*, including construction of up to one mile of temporary road. Current Forest Service regulations limit the size of commercial thinning projects that can be categorically excluded to 70 acres.[2] S. 1731 would vastly increase the size of such logging projects by 140 times.
- *Salvage logging of dead and dying trees*, including construction of up to one mile of temporary road. This 10,000-acre CE is 40 times larger than the current 250-acre size limitation for salvage logging CEs, which was adopted by the Bush Administration.[3] Careful planning is often required to ensure that salvage logging and road building do not result in extreme environmental damage, especially on fragile, severely burned soils.

Furthermore, Section 3(e) would exempt the Forest Service from analyzing the cumulative effects of logging projects that are categorically excluded from NEPA. This means that the agency could undertake multiple 10,000-acre logging projects in the same vicinity without considering their combined impacts on the area's water quality, wildlife, and recreational resources.

In addition, Section 3(f) of S. 1731 would create a fifth CE for logging projects up to 10,000 acres that are designed to reduce the risk of insect and disease infestations. This would effectively replace a CE authorized by the 2014 Farm Bill for collaboratively developed insect and disease treatment projects up to 3,000 acres.[4] Besides increasing the maximum size of the CE by 7,000 acres (11 square miles), S. 1731 would eliminate several of the 2014 Farm Bill's limitations on the use of the insect and disease CE. Specifically, under S. 1731, projects using the insect and disease CE –

- would not have to retain old-growth and large trees that are resilient to insects and disease,
- would not have to consider the best available science to maintain or restore ecological integrity, and
- would not have to be developed collaboratively.

<u>Eliminating NEPA Alternatives from Consideration</u>

---

[2] See 36 CFR 220.6(e)(12), which provides a CE for "harvest of live trees not to exceed 70 acres, requiring no more than 1/2 mile of temporary road construction. Do not use this category for even-aged regeneration harvest or vegetation type conversion. The proposed action may include incidental removal of trees for landings, skid trails, and road clearing. Examples include, but are not limited to:

(i) Removal of individual trees for sawlogs, specialty products, or fuelwood, and
(ii) <u>Commercial thinning</u> of overstocked stands to achieve the desired stocking level to increase health and vigor." (emphasis added)

[3] See 36 CFR 220.6(e)(13).

[4] See 16 USC 6591b.

For any Forest Service management project or activity that is not categorically excluded from NEPA, Section 4 of S. 1731 would eliminate NEPA's requirement to consider a reasonable range of alternatives. For major federal actions requiring an environmental impact statement (EIS), the bill would only require the Forest Service to analyze the agency's proposal and the alternative of no action. For projects requiring an environmental assessment (EA), the Forest Service would only analyze the effects of its own proposal. Thus, the bill would preclude the consideration of management alternatives presented by concerned members of the public, other agencies, tribes, and local governments.

Compared to the Healthy Forest Restoration Act of 2003 (HFRA)[5], S. 1731 would impose even more extreme limitations on NEPA alternatives. For projects that require an EA or an EIS, HFRA requires the Forest Service to consider (1) the agency's proposal, (2) a no-action alternative, and (3) an additional action alternative if one is proposed during scoping or a collaborative process and meets the purpose and need of the project. HFRA also requires the Forest Service to hold a public meeting and to facilitate collaboration among state and local governments and tribes and participation by interested citizens regarding the project. In contrast, S. 1731 provides no comparable opportunities for analysis of alternatives or public involvement. Furthermore, while HFRA applied only to "hazardous fuels reduction projects," S. 1731's limitations on NEPA alternatives would apply to all "forest management activities," which the bill broadly defines to include any "project or activity carried out by the Secretary on National Forest System land" (Sec. 2(2)).

Expanding Good Neighbor Authority to Include Environmentally Damaging Permanent Road Construction

Section 5(a) of S. 1731 would amend the 2014 Farm Bill to allow permanent road construction to be included in projects implemented by state forestry agencies on national forest lands through "Good Neighbor Authority." Current law limits the use of such authority to construction of temporary roads, which are typically less environmentally damaging than permanent roads.[6]

Re-Purposing Stewardship Contracting Authority to Benefit Timber Companies and Make Money for Counties

Section 6 of S. 1731 would make three problematic changes to the stewardship contracting authority provided by the 2014 Farm Bill. First, it would allow use of stewardship contracts for the purpose of perpetuating existing lumber mills in addition to the seven environmental stewardship purposes under current law. Second, it would allow stewardship contracts to be awarded to the lowest bidder, rather than on a best-value basis. Third, it would require 25% of any timber sale receipts from stewardship projects to be paid to local counties, thereby reducing the receipts that can be retained by the Forest Service to fund additional stewardship projects. All these changes would benefit

[5] See 16 USC 6514.
[6] See 16 USC 2113a(a)(3)(B).

timber companies and county governments at the expense of environmental protection and restoration of the national forests.

Restricting Judicial Review of Forest Service Decision-making

Section 7 of S. 1731 contains three provisions that severely restrict citizens' ability to use the federal courts to challenge Forest Service management activities.

First, it would amend the Healthy Forest Restoration Act of 2003 by greatly expanding the types of activities to which HFRA's limitations on judicial review would apply. (The HFRA limited the duration of preliminary injunctions, required lawsuits to be filed in the local federal district court, and required courts to balance the short-term impacts with the long-term benefits of hazardous fuel reduction projects.[7]) Instead of being confined to hazardous fuels reduction projects in the wildland-urban interface and fire-prone areas, the bill would apply HFRA judicial review to virtually "any vegetation management project."

Second, like the Westerman bill in the House (H.R. 2936), S. 1731 would entirely replace judicial review of a wide range of Forest Service projects with a "pilot arbitration program." The program could apply to any type of vegetation management, forest thinning, hazardous fuels reduction, or "any other project, as determined by the Secretary." The bill would give the Forest Service broad discretion to design and implement the alternative dispute resolution process, only requiring the agency to describe the process in a Federal Register notice.

Third, S. 1731 would limit the fees and expenses that are ordinarily available to prevailing parties under the Equal Access to Justice Act. The bill restricts the award of EAJA costs to "reasonable hourly reimbursements" and prohibits any award from being awarded to "a person that has substantial financial resources." The Forest Service would be required to define the above-quoted terms in regulations.

Taken together, these three provisions would make it much more difficult for anyone to challenge the legality of Forest Service land management decisions. Without access to the federal courts, it would impossible to ensure that the Forest Service is actually complying with federal environmental laws.

Thank you for considering our views on S. 1731.

Sincerely,

Mike Anderson

[7] See 16 USC 6516.

Senior Policy Analyst
The Wilderness Society

TO: U.S. Senate Committee on Environment and Public Works
FROM: The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Earthjustice, League of Conservation Voters, National Parks Conservation Association, Natural Resources Defense Council, Sierra Club, Southern Environmental Law Center, Western Environmental Law Center
RE: Detailed Concerns re S. 1731, "Forest Management Improvement Act of 2017"
DATE: September 27, 2017

The following is a summary and analysis of the "Forest Management Improvement Act of 2017" bill (S. 1731), scheduled for a hearing before the Senate Environment and Public Works Committee on September 27. Our respective organizations strongly oppose this bill because it would permit logging of vast areas of National Forest System land with virtually no public involvement, environmental analysis, citizen access to courts or assurance that environmental laws will be followed. We respectfully request that this commentary and accompanying factsheet be included in the committee hearing for the legislation.

Section 3: Reduces Public Involvement in National Forest Management through New and Expanded Categorical Exclusions

This section of S. 1731 would exempt several types of national forest logging projects up to 10,000 acres (15.6 square miles) in size from the public involvement and environmental analysis requirements of the National Environmental Policy Act (NEPA). Specifically, the bill would create four new legislative Categorical Exclusions (CEs) from NEPA:

- *Logging to create early seral habitat.* This CE could allow up to 10,000 acres of clearcutting to occur with no analysis of the environmental consequences and very limited public involvement. The size of this CE is orders of magnitude larger than the ecologically appropriate size of created wildlife habitat openings.
- *Logging to improve wildlife habitat.* This provision is unnecessary because the Forest Service already has an administrative CE for wildlife habitat improvement projects – see 36 CFR 220.6(e)(6). If the legislative CE in S. 1731 replaced the agency's existing CE, it could allow the Forest Service to spray herbicides and build an unlimited amount of road as part of habitat improvement projects, with scant public notice or environmental analysis.
- *Commercial thinning on timberland,* including construction of up to one mile of temporary road. Current Forest Service regulations limit the size of commercial thinning projects that can be categorically excluded to 70 acres – see 36 CFR 220.6(e)(12). S. 1731 would vastly increase the size of such logging projects by 140 times.
- *Salvage logging of dead and dying trees,* including construction of up to one mile of temporary road. This 10,000-acre CE is 40 times larger than the current 250-

acre size limitation for salvage logging CEs, which was adopted by the Bush Administration – see 36 CFR 220.6(e)(13). Careful planning is often required to ensure that salvage logging and road building do not result in extreme environmental damage, especially on fragile, severely burned soils.

Furthermore, Section 3(e) would exempt the Forest Service from analyzing the cumulative effects of logging projects that are categorically excluded from NEPA. This means that the agency could undertake multiple 10,000-acre logging projects in the same vicinity without considering their combined impacts on the area's water quality, wildlife, and recreational resources.

In addition, Section 3(f) of S. 1731 would create a fifth CE for logging projects up to 10,000 acres that are designed to reduce the risk of insect and disease infestations. This would effectively replace a CE authorized by the 2014 Farm Bill for collaboratively developed insect and disease treatment projects up to 3,000 acres – see 16 USC 6591b. Besides increasing the maximum size of the CE by 7,000 acres (11 square miles), S. 1731 would eliminate several of the 2014 Farm Bill's limitations on the use of the insect and disease CE. Specifically, under S. 1731, projects using the insect and disease CE –

- would not have to retain old-growth and large trees that are resilient to insects and disease,
- would not have to consider the best available science to maintain or restore ecological integrity, and
- would not have to be developed collaboratively.

Section 4: Eliminates NEPA Alternatives from Consideration

For any Forest Service management project or activity that is not categorically excluded from NEPA, the bill would eliminate NEPA's requirement to consider a reasonable range of alternatives. For major federal actions requiring an environmental impact statement (EIS), the bill would only require the Forest Service to analyze the agency's proposal and the alternative of no action. For projects requiring an environmental assessment (EA), the Forest Service would only analyze the effects of its own proposal. Thus, the bill would preclude the consideration of management alternatives presented by concerned members of the public, other agencies, tribes, and local governments.

Compared to the Healthy Forest Restoration Act of 2003 (HFRA), S. 1731 would impose even more extreme limitations on NEPA alternatives -- see 16 USC 6514. For projects that require an EA or an EIS, HFRA requires the Forest Service to consider (1) the agency's proposal, (2) a no-action alternative, and (3) an additional action alternative if one is proposed during scoping or a collaborative process and meets the purpose and need of the project. HFRA also requires the Forest Service to hold a public meeting and to facilitate collaboration among state and local governments and tribes and participation by interested citizens regarding the project. In contrast, S. 1731 provides no comparable opportunities for analysis of alternatives or public involvement. Furthermore, while HFRA applied only to "hazardous fuels reduction projects," S. 1731's limitations on NEPA alternatives would apply to all "forest management activities," which the bill

broadly defines to include any "project or activity carried out by the Secretary on National Forest System land" – see S. 1731, Sec. 2(2).

Section 5: Expands Good Neighbor Authority to Include Environmentally Damaging Permanent Road Construction

This section would amend the 2014 Farm Bill to allow permanent road construction to be included in projects implemented by state forestry agencies on national forest lands through "Good Neighbor Authority." Current law limits the use of such authority to construction of temporary roads, which are typically less environmentally damaging than permanent roads – see 16 USC 2113a(a)(3)(B).

Section 6: Re-Purposes Stewardship Contracting Authority to Benefit Timber Companies

This section would make three problematic changes to the stewardship contracting authority provided by the 2014 Farm Bill. First, it would allow use of stewardship contracts for the purpose of perpetuating existing lumber mills in addition to the seven environmental stewardship purposes under current law. Second, it would allow stewardship contracts to be awarded to the lowest bidder, rather than on a best-value basis. Third, it would require 25% of any timber sale receipts from stewardship projects to be paid to local counties, thereby reducing the receipts that can be retained by the Forest Service to fund additional stewardship projects. All these changes would benefit timber companies and county governments at the expense of environmental protection and restoration of the national forests.

Section 7: Restricts Judicial Review of Forest Service Decision-making

This section contains three provisions that severely restrict citizens' ability to use the federal courts to challenge Forest Service management activities.

First, it would amend the Healthy Forest Restoration Act of 2003 by greatly expanding the types of activities to which HFRA's limitations on judicial review would apply. (The HFRA limited the duration of preliminary injunctions, required lawsuits to be filed in the local federal district court, and required courts to balance the short-term impacts with the long-term benefits of hazardous fuel reduction projects – see 16 USC 6516.) Instead of being confined to hazardous fuels reduction projects in the wildland-urban interface and fire-prone areas, the bill would apply HFRA judicial review to virtually "any vegetation management project."

Second, S. 1731 would entirely replace judicial review of a wide range of Forest Service projects with a "pilot arbitration program." The program could apply to any type of vegetation management, forest thinning, hazardous fuels reduction, or "any other project, as determined by the Secretary." The bill would give the Forest Service broad discretion to design and implement the alternative dispute resolution process, only requiring the agency to describe the process in a Federal Register notice.

Third, S. 1731 would limit the fees and expenses that are ordinarily available to prevailing parties under the Equal Access to Justice Act. The bill restricts the award of EAJA costs to "reasonable hourly reimbursements" and prohibits any award from being awarded to "a person that has substantial financial resources." The Forest Service would be required to define the above-quoted terms in regulations.

Taken together, these three provisions would make it much more difficult for anyone to challenge the legality of Forest Service land management decisions. Without access to the federal courts, it would be impossible to ensure that the Forest Service is actually complying with federal environmental laws.

VOTE NO

on the so-called "Forest Management Improvement Act of 2017" (S. 1731)

AN ASSAULT ON OUR PUBLIC LANDS AND OUR DEMOCRACY

S. 1731 sacrifices our National Forest System and Bureau of Land Management lands by catering to industry interests at all costs.

The bill undermines the people's voice and destroys environmental protections by:

- **Severely weakening the National Environmental Policy Act (NEPA) by exempting massive national forest logging projects from public involvement and environmental analysis**
- **Eliminating citizen access to the courts**
- **Allowing permanent road construction on national forest lands**
- **Benefiting timber companies at the expense of national forest restoration**

A CLOSER LOOK INTO THE BILL

☑ CASTS ASIDE NEPA REQUIREMENTS FOR PUBLIC ENGAGEMENT AND ENVIRONMENTAL REVIEW

- Allows up to 10,000 acres (15 square miles) of clearcutting to occur with no analysis of the environmental consequences and very limited public involvement.
- Enables the Forest Service to spray herbicides and build an unlimited amount of road as part of habitat improvement projects, with scant public notice or environmental analysis.
- Disregards analysis of cumulative effects of logging projects once they are categorically excluded from NEPA. This means the agency could undertake multiple 10,000-acre logging projects in the same vicinity without considering their combined impacts on the area's water quality, wildlife, and recreational resources, all while eliminating the public's ability to comment on the projects.
- Precludes consideration of management alternatives presented by concerned members of the public, other agencies, tribes, and local governments by eliminating NEPA's requirement to consider a reasonable range of alternatives for any Forest Service management project or activity that is not categorically excluded.

☑ PRIORITIZES EXTREME COMMERCIAL LOGGING PROJECTS

- Increases the size of commercial logging/thinning projects by up to 140 times than what is currently allowed.
- Allows salvage logging projects (including construction of up to one mile of temporary road) that are 40 times larger than the current 250-acre size limitation for salvage logging CEs.
- Tilts national forest management away from environmental improvement and toward timber production by changing the way the Forest Service designs and manages "stewardship" timber sale contracts.

☑ **ELIMINATES SAFEGUARDS INCLUDED IN 2014 FARM BILL**

- Allows a CE of up to 10,000 acres for projects targeted to insect and disease infestations, increasing the current authority by 7,000 acres and eliminating several safeguards included in the bipartisan 2014 Farm Bill. Instead, projects:
  - would not have to retain old-growth and large trees that are resilient to insects and disease,
  - would not have to consider the best available science to maintain or restore ecological integrity, and
  - would not have to be developed collaboratively.

☑ **STIFLES THE FUNDAMENTAL AMERICAN PRINCIPLE OF CITIZEN ACCESS TO COURTS**

- Eliminates rights under the Equal Access to Justice Act for citizens to recover fees from the federal government when they prevail in court.
- Instead of being confined to hazardous fuels reduction projects in the wildland-urban interface and fire-prone areas, the bill would apply limited judicial review to virtually "any vegetation management project."
- Forces a host of management challenges through an internal and binding agency arbitration process that gives the agency the power to shield itself from whichever legal challenge it finds most problematic.

Our national forests and grasslands are a national treasure. They provide a broad range of values and benefits, including clean air and water, outstanding recreational opportunities, biodiversity, fish and wildlife habitat, forest products, erosion control, soil renewal, and more. It is critical to preserve and protect these public lands for future generations and provide the Forest Service with the resources it needs.

VOTE NO ON S. 1731

Senator BARRASSO. We are fortunate to have joining us today Senator Hatch, Senator Thune, Senator Tester, and Senator Daines. I am looking forward to your comments and your statements. I know you have very busy schedules, with additional commitments, so once you have had a chance to share information about your bills, those of you that have sponsored or cosponsored, welcome you to get to the remainder of your schedule.

So, Senator Hatch, we would like to start with you.

OPENING STATEMENT OF HON. ORRIN HATCH, U.S. SENATOR FROM THE STATE OF UTAH

Senator HATCH. Thank you very much, Mr. Chairman. Today I would like to speak in support of the bipartisan Sage Grouse and Mule Deer Habitat Conservation and Restoration Act.

This particular legislation would streamline important vegetation management projects to conserve and restore the habitat of sage grouse and mule deer in a way that carries an added benefit of reducing fuel modes for catastrophic wildfires.

I was eager to join Senator Heinrich in introducing this badly needed legislation because, across the West, especially in our home States of Utah and New Mexico, and elsewhere, wildlife populations are suffering from the dangerous encroachment of invasive pinyon and juniper trees. And, what is worse, these burgeoning forests increase the risk of wildfire, threatening homes, property, and human lives. Because sage grouse and mule deer share similar habitats, Senator Heinrich and I worked together to create a solution that would help restore sagebrush habitat and support these iconic western species.

As the Fish and Wildlife Service would agree, invasion of pinyon and juniper trees destroy sage grouse habitat and provides artificial nesting sites for predators of sage grouse. In the face of this challenge, responsible tree removal helps curtail this damaging expansion and carries widespread ecological benefits. In fact, wildlife managers in the West have long worked to convert pinyon and juniper stands to sagebrush because doing so increases forage and soil water availability, which improves wildlife carrying capacity, reduces wildlife risks, and benefits big game populations, particularly mule deer.

Although tree expansion is a natural process normally controlled by wildfire, fire suppression efforts over the years have allowed expansion to go unchecked. As a result, trees have spread to areas they have not historically occupied because wildfire, which threatens wildlife, private property, and human lives, is no longer a viable option for combating forest expansion. Effective alternatives are needed to limit the damage caused by invasive trees.

Fortunately, Federal restoration projects have proven successful in replicating the benefits of wildfire, while avoiding its associated damages to natural habitat, adjacent property, or human neighbors. Our legislation helps build on these successes by removing lengthy, cumbersome environmental review processes for vegetation management projects that benefit sagebrush ecosystems.

Though targeted tree removal would seem to be a commonsense priority, Senator Heinrich and I found that responsible management efforts by Federal agencies are frequently delayed by needless

bureaucratic impediments. So, to help safeguard and reinvigorate sage grouse and mule deer habitats, we agreed to accelerate the approval of beneficial vegetation management projects by giving the Bureau of Land Management expanded tools to aid its sagebrush restoration efforts.

As I mentioned earlier, this is a bipartisan effort, and a diverse group of stakeholders have come out in support of the reasonable measures contemplated in this bill. I am confident that passage of this legislation will bolster ecological health and promote sustainable populations of wildlife species that depend on sagebrush habitat.

Our bill will also reduce the risk of costly catastrophic wildfire. In accomplishing this goal, I believe we can benefit communities throughout the West that rely on sportsmen and natural resource development as economic drivers, while still sending a clear message that we are serious about sound environmental stewardship.

Mr. Chairman and other members of the Committee, it is critical that we get this legislation signed into law, and I appreciate the opportunity today to speak to the merits of this bill. I want to thank the Chairman and the members of the Committee, with whom I am eager to work in moving this bill forward, and I just appreciate this opportunity to make these points.

Senator BARRASSO. Thank you very much, Senator Hatch.

Senator Thune, welcome to the Committee.

OPENING STATEMENT OF HON. JOHN THUNE, U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator THUNE. Thank you, Mr. Chairman. Chairman Barrasso, Ranking Member Carper, and members of the Committee, I appreciate the invitation and opportunity to speak today on behalf of a bill that I introduced in August, which is Senate Bill 1731, the Forest Management Improvement Act of 2017.

Mr. Chairman, we have all heard the saying that Nero fiddled while Rome burned. Well, this happened in A.D. 64, when, for 6 days and seven nights, the citizens of ancient Rome watched helplessly as their city burned.

Fast forward to 2017 and we have a familiar scene. Since January 1 of this year, through today, Americans have watched 49,000 fires burn more than 8.4 million acres of forestland. According to the U.S. Forest Service, since 2000, wildfires have burned an average of 6.9 million acres every single year.

But, Chairman, after nearly a quarter century of hands-off management, fire suppression costs have grown, as Ranking Member Carper pointed out, from 16 percent of the Forest Service annual appropriated budget in 1995, to 52 percent of the Forest Service annual budget in 2015. We must take immediate steps to improve the health of our Nation's forestland by being much more aggressive and proactive when it comes to forest management. Because forest fires are occurring on a large scale across the western United States, proactive management to protect our forests must be initiated on a large scale.

Mr. Chairman, I believe my bill being discussed here today offers commonsense solutions that would help solve our problems of declining forest health. In short, my bill would one, increase current

categorical exclusions from 3,000 to 10,000 acres; two, allow the Forest Service to take steps to rapidly salvage dead and dying trees after wildfires, ice storms, or wind events; three, expedite the environmental review process; four, create a single Good Neighbor Authority policy; five, clarify congressional intent on stewardship contracting; and, finally, six, provide much greater certainty for project level decisions through litigation relief.

Proper management of forests makes them resilient and better able to withstand fires, pests, and diseases. We must allow expanded use of 21st century techniques by land management professionals, and not cave to the direct mail specialists and litigators whose misguided efforts have resulted in disasters in our forestland.

We have the technology and know-how to restore America's cherished landscapes back to healthy natural conditions, and we should waste no more time to use this technology to preserve and protect our Nation's forest landscape.

Mr. Chairman, I urge my colleagues to support this bill. I thank you, Mr. Chairman and Ranking Member, for bringing Senate Bill 1731 before this Committee and inviting me to speak on behalf of this important legislation. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you, Senator Thune.

Senator Tester, welcome to the Committee.

OPENING STATEMENT OF HON. JON TESTER, U.S. SENATOR FROM THE STATE OF MONTANA

Senator TESTER. Well, thank you, Chairman Barrasso and Ranking Member Carper, and thank you to all the members on the Committee. It is a pleasure to be here today to talk about this important legislation. And I also want to thank my colleague, Senator Daines, for sponsoring this important bill.

In Montana and across this Country, we are experiencing a historic wildfire season. A changing climate, historic drought, longer summer, a crippled Forest Service resulting in a lack of forest management turned Montana into a tinderbox, and all it took was Mother Nature to light it up, and she did.

Over 1 million acres of Montana is burned, and we are not out of the woods yet. A dangerous and costly wildfire season forced the Forest Service to burn through much of their budget and already start the fire borrowing process.

In its 2015 Cottonwood decision, the Ninth Circuit Court of Appeals ruled that the Forest Service can be required to continuously update its forest plans to protect an endangered species, even if it has already consulted with the Fish and Wildlife Service, even if it has updated its forest plan, and even continues to consult with the agency for projects under this plan.

This means that the Forest Service actively, under that plan, from timber harvest to watershed restoration, could be put under an injunction for years while the plan is updated. And there is no guarantee that the plan won't need to be updated again and again and again as new species listed or habitat areas are changed. All the while the forest goes unmanaged.

The Cottonwood decision has already led to injunctions on five vegetation management projects in Montana alone. One of those,

the Stonewall Vegetation Project, included fire mitigation work, and part of that burned this summer as well. Across Regions I, II, and IV, at least 80 projects are at risk.

This bill is targeted as a bipartisan fix to this court case. We need to support the recovery of endangered species, there is no doubt about that, but blocking forest management across the board is not going to help our forests. This legislation that you are going to consider today, the Litigation Relief for Forest Management Act, will help address the real and pressing issues for our Forest Service.

It will help put saws in people's hands, cut trees, mitigate wildfire hazards, restore habitat, strengthen timber economy, and maybe most importantly, maintain our forests. It will ensure the requirements to update forest plans make sense and that the Forest Service will be able to get started on their projects, instead of being stuck in a constant bureaucracy and endless litigation. It will cut through red tape and allow for the Forest Service to spend more time in the woods and less time in the courtrooms.

This legislation will help good forest projects move forward. These projects are carefully designed. They take input from Fish and Wildlife Service, they will take input from the public, and, ideally, they will hold up in court.

But for the Forest Service, to get the job done and win in court, they need the resources to do the analysis. If the Forest Service spends over half its money in fighting fires, that is less money for responsible forest management; it is less money to create recreational access, to create watershed protections, and the due diligence that they need in order to succeed in court and produce a healthy forest.

The Forest Service is already borrowing $300 million to cover firefighting costs this year. This depletion means it won't be able to responsibly manage our forests, making it harder to mitigate the impacts of wildfires. Sadly, the Senate seems incapable of addressing climate change in a responsible and tangible way, and I think that is a big problem.

We may not be able to decide on how to tackle climate change today, but we should be able to give the Forest Service the tools they need to responsibly manage our forests. The Litigation Relief for Forest Management Act is a good start, but we will need to address the funding issues within the Forest Service as well.

Thank you, Mr. Chairman.

Senator BARRASSO. Well, thank you very much, Senator Tester.

Senator Daines, welcome to the Committee.

OPENING STATEMENT OF HON. STEVE DAINES, U.S. SENATOR FROM THE STATE OF MONTANA

Senator DAINES. Thank you, Chairman Barrasso, Ranking Member Carper for holding today's hearing on Senate Bill 605, my legislation with Senator Tester to increase active forest management by fixing a damaging court decision that just creates red tape and blocks much-needed projects on the ground with no benefit to the species.

We burned over 1 million acres in Montana this fire season. In fact, the Ranking Member, it is the size of the State of Delaware.

Senator CARPER. Huge.

Senator DAINES. It is big.

[Laughter.]

Senator DAINES. To put it in perspective, we lost two firefighters, too, and a sobering thought, lost their lives in Montana fighting those fires.

Let me say up front that this legislation codifies the legal position taken by the Obama administration. Leaders of the Department of Agriculture and Department of Interior under the current Administration, likewise, have expressed support for the core elements of my legislation.

There is a reason there are two Montanans in front of you today on the hearing. Montana had two of the three most expensive fires in the Nation. I just saw the brief from Secretary Perdue yesterday. Stack ranked the most expensive fires, the top 20. Montana, No. 1, was the Lolo Peak fire south of Missoula, and No. 3 was the Rice Ridge fire near City Lake.

Furthermore, Representative Mike Simpson and Representative Collin Peterson have introduced bipartisan companion legislation in the House, so we have this from a bipartisan, bicameral viewpoint, as well as administrative support. It is also supported by dozens of organizations, several sportsmen and conservation groups, as well. Simply put, it has strong bipartisan roots and strong bipartisan support.

Senator Bill 605 responds to the Ninth Circuit ruling in the U.S. Forest Service versus Cottonwood Environmental Law Center that the Forest Service is required to do an extra layer of plan level consultation with the U.S. Fish and Wildlife Services following the designation of critical habitat for the lynx species. To be clear, the Forest Service and Fish and Wildlife Service were already conducting robust scientific analysis with regard to lynx habitat at the project level, so these agencies were and are fully committed to the conservation of the species.

The Cottonwood ruling stands in contrast with a Tenth Circuit ruling on a related case in 2007. Unfortunately, in 2016, October, the Supreme Court declined the Obama administration's petition to resolve the conflicting circuit court opinions, which effectively upholds the Ninth Circuit ruling.

As highlighted by President Obama's Department of Justice, the Cottonwood ruling has "the potential to cripple the Forest Service and BLM's land management functions."

DOJ also highlighted that this decision substantially increases unnecessary paperwork requirements without any conservation benefit. And far from being just a case about the lynx, the Department of Justice noted that there are more than 850 listed species in the geographical area of the Ninth Circuit, and emphasized the sheer volume of agency resources that would be required to adhere to the court's decision.

We are seeing this firsthand in Montana, as the Forest Service is now prioritizing re-consultation with the U.S. Fish and Wildlife Service on the lynx first, above other work like grizzly bear consultation and permitting projects.

Today there are five forest management projects in Montana comprising over 150 million board feet of timber that have been

blocked through injunctions due to the Cottonwood decision. These projects were designed to achieve critical objectives such as reducing the risk of wildfires, improving habitat, and protecting water quality. Several of these projects were developed through locally driven, collaborative process that involved diverse stakeholders working together to improve forest health, and yet each one was stopped due to repeat fringe litigants capitalizing on the Ninth Circuit's disastrous Cottonwood ruling.

And perhaps the most alarming example, and Senator Tester just alluded to it, was the injunction of the Stonewall Vegetation Project near Lincoln, Montana. This project was enjoined this past spring, just days before the work was scheduled to begin. And about 1 month later, guess what happened? Fires broke out on some of the very acres that would have been treated under this project.

While I can't say the project would have prevented the fire, the mere fact that wildfires occurred in areas that could not be treated due to the Cottonwood shows that we need to urgently pass my bipartisan legislation to statutorily reverse this decision. Senator Bill 605 simply clarifies that Federal agencies do not need to do the extra layer of unnecessary consultation that is required by the Cottonwood decision. This will statutorily fix right now this conflict we have with the circuit courts. Removing this burden will allow Federal agencies to have more time to complete preventive work on the ground, while also creating good paying wood products jobs.

I strongly believe this legislation, together with other management and wildfire funding reforms, should be passed into law this year. We say out in Montana either we are going to manage the forests or the forests are going to manage us.

I look forward to working with this Committee toward that end. Thank you.

Senator BARRASSO. Thank you very much, Senator Daines. We appreciate you bringing forth this bipartisan piece of legislation and are very grateful for your leadership. Thank you.

We will now hear from our witnesses.

I am pleased to first introduce Jessica Crowder, who serves as a Policy Advisor for Wyoming's Governor Matt Mead. From her work for the Governor's Office and as a former policy analyst for the Wyoming Department of Agriculture, Jessica knows the value of strong coordination among States, Federal, and local agencies.

Jessica holds a bachelor's and master's degrees in range management, during which she studied post-fire activities, including grazing following prescribed fire during summer months.

Jessica is a key member of the Governor's Task Force on Forests, which concluded January 2015, and she continues to work closely with me and my staff to develop forestry solutions for Wyoming. Jessica wears many hats and offers a unique perspective on the way fire affects forest health.

Jessica, I appreciate you making the trip to be with us today. I look forward soon to hearing your suggestions for improving forest health for the next generation.

In addition to Ms. Crowder, we have Mr. Lawson Fite, who is a General Counsel for the American Forest Resources Council. We appreciate you being here today.

And Mr. Collin O'Mara, good to see you again, President and CEO of the National Wildlife Federation.

I would like to remind the witnesses that your full testimony will be made part of the official hearing record today. Please try to keep your comments to 5 minutes so that we may have time for questions.

Ms. Crowder, please begin.

STATEMENT OF JESSICA CROWDER, POLICY ADVISOR, OFFICE OF GOVERNOR MATTHEW H. MEAD

Ms. CROWDER. Thank you and good morning, Mr. Chairman and members of the Committee. Thank you for the opportunity to testify on enhancing forest management to effectively mitigate wildfires.

Wyoming's forested lands make up more than 11 million acres of our State, and over 60 percent is administered by the Forest Service and the Bureau of Land Management. Federal impediments to active management have negatively affected Wyoming's economy, natural resources, private property, and human health.

The current situation on forested lands in Wyoming and across the Country demands immediate action. Governor Mead believes we can do better in managing our forests. He created a Task Force on Forests in 2013 to analyze and consider response strategies for forest management. Through this and subsequent work, we believe there are opportunities to reach the goal of sustainable forests.

Wyoming's forests offer an illustration of the need for active management. Logging, mechanical treatments, managed livestock grazing, prescribed fire, managed wildfire, all of these serve to improve forest health and the multiple benefits derived from our forests. Despite this knowledge, we have not been able to fully implement active management at a landscape scale, and the results are concerning.

Over the past 20 years, aerial detection surveys have mapped over 4.6 million cumulative acres of trees killed by insect and disease in Wyoming alone. Catastrophic wildfires and the costs to fight wildfires have increased across the West. Unmanaged forests impact the ecosystems and essential benefits they provide. Dead trees pose a hazard for humans. Downed trees make it difficult for people and animals to use an area. Forage for livestock and effective wildlife habitats are reduced. It is difficult to access areas for treatment for livestock management or for recreational pursuits such as mountain biking, hunting, and hiking.

Forests impacted by insects and disease also make firefighting difficult. 2017 has been average year in terms of wildfires for Wyoming. Unfortunately, this is not true for several western States. For Wyoming, the fire season of 2012 was an intense and record setting year: over 700,000 acres burned and over 75 residences were destroyed. The suppression costs totaled approximately $110 million.

Increased occurrences of catastrophic wildfires can harm municipal watersheds. High intensity fires increase erosion and sedimentation in reservoirs that provide water for people. Wyoming's air quality has also been affected by smoke. The first 2 weeks of September were particularly smoky. The Wyoming Department of

Environmental Quality has recorded nearly 40 values over air quality standards for particulate matter and ozone since July.

Because of these impacts of unmanaged forests and wildfires to Wyoming, I offer these potential solutions.

First, I would like to address insect and disease areas. Congress gave the Forest Service the ability to use categorical exclusions under the Agricultural Act of 2014, or the Farm Bill, in designated insect and disease areas. Federal agencies are, in some instances, hesitant to utilize existing authorities and capitalize on opportunities to complete analyses in an expedited manner. In Wyoming, over 2 million acres have been designated. To date, this tool has not been used in our State.

Congress should urge the use of categorical exclusions already allowed in insect and disease areas. Additionally, increasing the acreage allowed to be considered under a categorical exclusion would be beneficial. It will take management on a larger scale than has occurred in recent years to effectively decrease wildfire risks.

Second, Wyoming has worked to increase partnerships with both the Forest Service and the BLM. The permanent authorization and expansion of Good Neighbor Authority and the Farm Bill is important for getting more work done on the ground. This work contributes to proactive management and decreased potential for large intense fires.

However, the Farm Bill does not allow permanent roads to be reconstructed under Good Neighbor Authority, and these roads are often necessary. We recommend removing this provision.

And, finally, I would like to discuss the National Environmental Policy Act. NEPA was enacted to fulfill a specific purpose. It is a procedural statute designed to disclose impacts and assist Federal agencies in making decisions. Yet, NEPA has evolved into a cumbersome and costly process. Analyses often contain unnecessary information in an effort to guard against or answer possible litigation.

A change in the NEPA process through legislative action and agency action is necessary. My written testimony contains simple suggestions for improving NEPA. Slow and unwieldy analyses do not provide for progress in reacting to ever-changing conditions on the ground. A shift from how the law is currently being executed will require leadership, and I submit that this Committee is exceedingly qualified to undertake and accomplish the goal of restoring and streamlining NEPA.

In closing, Governor Mead appreciates this Committee's continued leadership and interest in finding solutions to the crisis we are seeing on our western landscapes.

Thank you again for this opportunity to share Wyoming's perspective, and I welcome any questions you may have.

[The prepared statement of Ms. Crowder follows:]

Testimony of Jessica Crowder
Policy Advisory to the Honorable Matthew H. Mead
Governor of Wyoming

Before the U.S. Senate Committee on Environment and Public Works

September 27, 2017

Mr. Chairman and Members of the Committee,

I appreciate the opportunity to testify before the committee today. I have worked in the field of natural resource management and planning for approximately 12 years. Currently, I am a Natural Resources Policy Advisor to Wyoming Governor Matt Mead. I appreciate the opportunity to share Wyoming's perspective on forest management.

We must find a path that applies active management to Wyoming's forests and our nation's forests. The impacts of unmanaged forests crosses land ownership boundaries and impacts air, water, recreational opportunities, wildlife habitat, livestock grazing, forest products and jobs. The current situation on forested lands in Wyoming and across the country demands immediate action. Governor Mead recognizes the need to improve management of our forests. Because of potential threats to Wyoming's economy, culture and ecology, Governor Mead created the Task Force on Forests[1] (Task Force) in 2013 to analyze and consider response strategies and recommendations for forest management. Through the recommendations of the Task Force and subsequent work in Wyoming, we believe there are several opportunities to address challenges to reaching our goal of forests that contribute to multiple uses and resource values. This path forward must include expediting National Environmental Policy Act (NEPA) analyses and improving partnership opportunities.

Challenges

Wyoming's state and national forests offer an illustration of the need for active forest management. Logging, mechanical treatments, managed livestock grazing, prescribed fires and managed wildfires all serve to improve forest health and the multiple benefits derived from healthy forests. Despite this knowledge, we have not been able to fully implement active management at a landscape scale and the result is concerning. Over the past 20 years, aerial detection surveys have mapped over 4.6 million cumulative acres of trees killed by insects and disease in Wyoming alone. Catastrophic wildfires, and the cost to fight wildfires, have increased across the west. Our forests are not managed for health and sustainability.

As an example, the Medicine Bow National Forest in south central Wyoming has experienced significant levels of beetle infestations since the 1990s. The U.S. Forest Service has determined

[1] See *Final Report, Governor's Task Force on Forests*. Last accessed September 22, 2017 at http://www.uwyo.edu/haub/_files/_docs/ruckelshaus/collaboration/2013-forests/2015-forest-task-force-final-report.pdf

that approximately 86 percent of forested acres (559,782 of 652,860 acres) in the Snowy Range and Sierra Madre portions of the Medicine Bow National Forest have been impacted by beetle infestations. This drastic change on these two mountain ranges has had negative consequences that are similar to other forested areas of Wyoming (Attachment 1 – Sierra Madre Range). The Medicine Bow National Forest has increased vegetative treatments and timber sales in an attempt to address the poor conditions but these efforts have not kept pace with the need for management.

Federal impediments to management have negatively affected Wyoming's economy, natural resources, private property and human health. Wyoming contains more than 11 million acres of forested land, 53% of which is administered by the U.S. Department of Agriculture-U.S. Forest Service (USFS) and 11% is administered by the U.S. Department of Interior- Bureau of Land Management (BLM). Not all of this acreage is considered "nonreserved timberland" – some is permanently reserved through statue or administrative designation such as Wilderness or National Parks.

Wyoming's timber production has improved in recent years, but production is below levels seen in the late 1900s and early 2000s. Mills in Wyoming have experienced increases in their capacity. However, the total number of mills has decreased. The loss of mills has an impact on Wyoming's economy and on Wyoming's ability to utilize forest products and complete vegetative treatments. This is compounded by dead and dying forests that contain trees that, as time passes, lose their usefulness as a forest product.

Unmanaged forests also have impacts on the ecology of an area and the people and animals that use those forests. Our forests lack the diversity of age class and structure that is necessary for ecosystems to provide essential benefits. Dead trees in Wyoming pose a hazard for wildlife, livestock and humans. Down trees make it difficult for people and animals to use an area. Forage and habitat quality and quantity for wildlife and livestock are reduced. It is difficult for managers to access areas for treatments, livestock management or recreation pursuits such as mountain biking, hunting and hiking.

Forests impacted by insects and disease also make firefighting difficult and often unsafe. 2017 has been an average year in terms of wildfires for Wyoming. Unfortunately, this is not true for several western states. The fire season of 2012 was an intense and record setting year for Wyoming. Over 700,000 acres burned and over 75 residences were destroyed. Total suppression costs were approximately $110 million with the State of Wyoming's share of that cost approximately $43 million. The intensity of fires caused concerns over the potential for widespread establishment of invasive species, including cheatgrass.

The practice of using funds intended for specific projects and programs to pay for wildfires, also known as "fire borrowing," further erodes forest management, hazardous fuel reduction projects, habitat improvement projects and other projects within the federal agencies. We support congressional efforts to end this practice.

Wyomingites are concerned that increased occurrences of catastrophic wildfires will harm their municipal watersheds. High intensity fires have the potential to remove large amounts of

vegetation, increasing erosion and sedimentation in reservoirs that provide water for municipalities throughout the state. Governor Mead's Task Force on Forests addressed this concern by recommending the development of cross-jurisdictional watershed protection plans for municipal water supply drainages. Two studies have been completed. These studies focus on proactive management to preserve and enhance water quality and to avoid catastrophic effects of large-scale fires on municipal watersheds.

Wyoming's air quality has been affected by smoke from wildfires within the state and from wildfires in other states such as Montana, Idaho and Oregon throughout the summer of 2017. This smoke has periodically caused elevated values of pollutants such as $PM_{2.5}$, PM_{10}, nitrogen oxides, and ozone throughout the summer. The first two weeks of September were particularly smoky, which had a severe impact on air quality throughout Wyoming. The Wyoming Department of Environmental Quality, Air Quality Division has recorded nearly 40 values over the level of the air quality standards for particulate matter and ozone since July. The cities of Sheridan, Casper, and Cheyenne and the Powder River Basin area were the most impacted.

Regulatory challenges also exist. NEPA analyses are costly and time consuming processes that slow proposals for active management. As forested landscapes change due to insects, disease and catastrophic wildfires, so must the ability of federal agencies to complete appropriate NEPA analyses, address challenges and create healthy forests in a timely manner.

Solutions

Governor Mead's Task Force on Forests contains several recommendations that the State of Wyoming continues to work towards. I will address three possible solutions that generally fall within the recommendations made by that Task Force.

Good Neighbor Authority

Wyoming has worked to increase partnership opportunities with both the USFS and the BLM. The permanent authorization and expansion of Good Neighbor Authority in the 2014 Farm Bill has been an important tool for getting more work done on-the-ground. This work contributes to proactive management and decreased potential for large, intense forest fires. However, as you are aware, the 2014 Farm Bill does not allow permanent roads to be reconstructed under Good Neighbor Authority, as described below:

- *16 U.S.C. 2113a(a)(3)(B)(i), Section 8206 (a)(3)(B)(i), provides that permanent roads are excluded from Good Neighbor Authority*

This exclusion is cumbersome – it requires a separate contract to maintain and/or reconstruct permanent roads that are often necessary to complete projects allowed under Good Neighbor Authority. We recommend removing this provision.

Insect and Disease Areas

Congress gave the USFS the ability to use categorical exclusions under Section 8204 of the Agricultural Act of 2014 (2014 Farm Bill) in designated insect and disease areas. Federal agencies are, in some instances, hesitant to utilize existing authorities and capitalize on

opportunities to complete NEPA analyses in an expedited manner. Under the 2014 Farm Bill authority Governor Mead requested over 1.5 million acres be designated as Insect and Disease Areas. Since that time, the Medicine Bow National Forest has requested an additional 751,000 acres be designated. To date, this tool has not been utilized in our state. Congress should urge the USFS to use categorical exclusions already allowed in designated Insect and Disease Areas.

Additionally, increasing the acreage allowed to be considered under a categorical exclusion in Insect and Disease Areas would be beneficial. Large areas of Wyoming and the west have been impacted by insects and disease and increased acreage would assist in addressing large landscape-scale treatments quickly and efficiently. It will take management on a larger scale than has occurred in recent years to effectively decrease wildfire risks.

Expedite NEPA

As you are aware, the National Environmental Policy Act of 1969 was enacted to fulfill a specific purpose, as described below:

- *Sec. 2 [42 USC § 4321]. The purposes of the Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.*

NEPA is a procedural statue designed to disclose impacts and assist federal agencies in making decisions. Yet NEPA has evolved into a cumbersome and costly process often developed with the thought of defending against litigation in mind. NEPA analyses often contain unnecessary information in an effort to guard against or answer possible litigation. I believe this moves NEPA beyond the simple intent originally adopted. Slow and unwieldy NEPA analyses do not provide for progress in reacting to ever-changing conditions on-the-ground.

The NEPA was originally intended to be a useful planning tool. We recommend relatively simple changes to restore the original intent. I believe a look at the original intent of the law is required to change how we apply the law. This is a significant shift from how the law is currently being executed and will require strong leadership. I submit that this committee is exceedingly qualified to undertake and accomplish the goal of streamlining NEPA.

A change in the NEPA process, through either legislative action or informal agency actions such as manual updates, is necessary. NEPA itself requires a specific sequence of actions occur in order to reach a final decision. This process is initiated by a Notice of Intent and Scoping, followed by a Draft Environmental Impact Statement (EIS) for public comment. Public comments are considered, the EIS is edited and a Final EIS is released. Finally, the Record of Decision is signed. My personal experience has been that outreach to entities outside the federal agencies is limited in the early stages of development. Often, other entities, such as states, have specific expertise, data and insight into the project under consideration that would significantly contribute to the NEPA analysis early in the process. Requiring early outreach in the analysis process would reduce the time and resources required to reach a decision.

There are other steps that could occur to expedite NEPA. Federal agencies can commit to meeting early and often with state and local governments - building a common understanding of legal and regulatory jurisdiction. They should discuss plans, programs, policies and processes of the state and local governments and how those authorities are to be addressed in the NEPA process (e.g., development of the preferred alternative). This has potential to reduce or eliminate the submission of adversarial comments (see 40 CFR § 1501.1(b)) at later stages in the process and allow for issue resolution prior to the release of a Final EIS.

States and federal agencies should share, update and utilize information in a cooperative manner to enhance planning and implementation. This action could improve the establishment of current management situations and needs for change (see 43 CFR § 1610.4-4). States and local governments should also be able to participate on interdisciplinary teams where they have expertise or jurisdiction by law and have access to information that will inform the process and planning (see 40 CFR § 1501.6(b)(4)).

Conclusion

Enhancing forest management to proactively address forest health and decrease wildfires is necessary. Governor Mead appreciates this committee's continued leadership and interest in finding solutions to the crisis we are seeing on our western landscapes.

Thank you again for this opportunity to share Wyoming's perspective on ways to strengthen forest management. I welcome any questions you may have.

Western Governors' Association Policy Resolution 2017-10

National Forest and Rangeland Management

A. BACKGROUND

1. The American West encompasses a huge landmass representing 2.4 million square miles or over two-thirds of the entire country. Over 112 million people live in these states and they reside in large, densely populated cities, smaller cities and towns and in rural areas.

2. Perhaps more than any other region, terrain, forces of nature, and land ownership patterns in the West underscore the purpose and vital need for a more active federal role in forest management. Western states include more than 75 percent of our national forest and grassland system. These public lands serve as critical economic drivers, and they provide numerous conservation benefits, water supply, and recreational opportunities for Western communities and the nation.

3. States have a particular interest in improving the active management of federal forest lands. State governments have trust authority over water, wildlife and forest resources, along with primary authority and expertise to protect community health and safety. Poorly managed forests can have significant and broad impacts on the landscapes and communities of the West, including negative impacts to air quality and public health, degradation of rivers and streams and associated water quality (including drinking water), reduced forage for domestic livestock, impaired habitats for wildlife and fish, and the loss of forest products and associated jobs.

4. Relative to decades past and other forest landowners, forest managers today operate under a constrained decision space as they work to address contemporary issues such as climate change, invasive pests and diseases, habitat diversity, fuel build-ups and fire risk, and legacy impacts. Adding to this challenge are concerns about the economic and social vitality of rural communities that experience impacts from reduced timber supply and compromised forest health. Displaced workers, declines in school enrollment, aging demographics, property loss, business closures and revenue impacts due to wildfire, and high unemployment are not uncommon to these communities.

5. States are managers as well, and many Western states own extensive public land holdings that require forest products infrastructure to achieve community vitality and land management goals, including ecological restoration objectives and healthy and resilient forests.

6. The U.S. Forest Service business model has historically been based on a combination of federal appropriations that were supplemented with revenue from resource sales and fees. Until the early 1990s, the Forest Service was a net contributor to the Federal Treasury. Over the past 20 years, timber sales have dramatically declined.

7. In addition, the last decade has seen several large, very expensive wildfires, which have increased the U.S. Forest Service wildfire suppression costs from 13 percent of the agency's FY 1991 budget to nearly 50 percent over the last several fiscal years. Consequently, under the current agency budgeting framework, forest management, hazardous fuels reduction, habitat improvement, and outdoor recreation programs have been negatively impacted across national forests and Department of Interior lands.

8. An April 2015 study by the U.S. Forest Service, the *Collaborative Forest Landscape Restoration Program 5-Year Report, FY 2010 – 2014*, found that the past century of wildfire suppression and legacy management practices have contributed to forests being overstocked and primed for larger and more intense blazes, and that changes in land use and increasing social pressures make it difficult for the agency to let fire play its natural role of clearing the forest understory in certain forest types. Active forest management has historically played a pivotal role in the growth and mortality cycle of forests to manage fuel loading, which in turn can reduce fire-fighting costs and improve habitat resilience. Today, the U.S. Forest Service estimates that roughly 90,625 square miles – an area larger than Utah – is at high or very high risk of severe wildfire and in need of treatment.

9. Insect infestation and disease have damaged many of the forests throughout the West. Severe drought conditions that are impacting western states, particularly California, have only exacerbated insect infestations and tree mortality. The impacts go well beyond fire risk, and timber and fiber production are negatively impacted, threatening the viability of the surviving forest product infrastructure. The significant decline in forest health has also created serious threats and challenges to watershed integrity, wildlife and fisheries habitats, recreational uses, businesses and tourism. All of these impacts present substantial challenges for forest-dependent communities across the West.

10. The dire forest conditions, unmet management needs, and the failure to provide lasting protections for some landscapes have brought diverse stakeholders together to find solutions. Community collaboration on forest health projects is robust in numerous places across the West forging broad agreements among diverse stakeholders on projects that encompass fuels reduction, fiber production, habitat restoration, long-term protection for critical areas, and other community objectives. It is not uncommon to find mill owners, hunters and anglers, loggers, small business owners, conservationists, and local elected leaders working together around the table.

11. Collaborative planning and project implementation across National Forests and state and private forest lands on a larger scale allows for more diverse interests to address their particular needs for a landscape or a watershed. Taking a broad look at a landscape for planning purposes minimizes the challenges associated with managing lands for the benefit of a particular species or to address a specific need. Well-planned projects that are strategically placed across a landscape can result in a higher level of benefits than those that are more randomly or opportunistically placed. Processes associated with planning and implementing a project have become so time consuming and expensive for National Forests in particular that a disincentive often exists for their managers to proceed with management actions that are needed to attain desired ecological, social, and economic objectives.

12. Collaborative efforts have shown initial successes in reaching consensus, but there is a shortage of formal mechanisms that encourage their creation in areas with conflict or reward their success within the context of public process. Further, there is little to no formal incentive for the management agencies and collaboratives to ensure collaborative work happens in a timely and efficient manner that achieves a pace and scale of management that matches the ecological, social, or economic needs of public and private forestlands and surrounding communities.

13. Despite this good work the full benefits of these collaborative efforts have not been realized on the land. Working constructively with collaborators requires resources to be productive and the federal agencies often lack the necessary staff and funding. In addition, the federal agencies have sometimes been reluctant to embrace collaboration, because they either have unclear legal authority to favor collaborative efforts or don't welcome the input.

14. Further, and even when collaborative forest health projects enjoy broad support from diverse stakeholders and the agencies, administrative objections and litigation remain a too frequent outcome. One result is that community collaborative efforts become fatigued, and future opportunities are lost. Another outcome is that Forest Service restoration projects often go through exhaustive, time-consuming analysis, driving up costs and preventing the agency from scaling up management to meet the scope of the problem.

15. Today the costs associated with planning and implementing a management project on National Forest lands are significantly more than those of the private sector. This cost, along with the time associated with drafting, analyzing, incorporating public involvement, and responding to appeals and/or litigation at the project level, lead many federal managers to focus their limited staff, funds and time on projects with the least likelihood to be challenged. This approach does not adequately address the larger socio-economic and ecological needs of our National Forests and dependent communities.

16. The 2014 Farm Bill provided the Forest Service with several new tools to accelerate forest restoration. A Governor could nominate landscapes substantially affected or threatened by insects and disease to the Secretary of Agriculture for designation as Priority Areas for expedited NEPA and administrative process and judicial review. 16 Western Governors nominated areas for this designation, the vast majority of which were approved by the Secretary of Agriculture.

17. In addition, the new Farm Bill authorities provided for a categorical exclusion (CE) for insect and disease projects on areas as large as 3,000 acres that are the product of a collaborative effort. The new CE has the potential to greatly magnify the role of collaboration and strengthen the results of those efforts, and to reduce the time and cost for forest health projects, resulting in on-the-ground restoration work that is accomplished more quickly and across a larger landscape. Not yet in wide use, the Farm Bill also added expanded "Good Neighbor" authority that enhances the ability of states to partner with the Forest Service and implement projects on federal land.

18. The shortcomings of federal forest management have also impacted local governments directly. In 1908, when Congress created the National Forest System, it also passed the National Forest Revenue Act in 1908 directing the Forest Service to share 25 percent of gross revenues with local governments. Then in 1976, Congress passed "Payments in Lieu of Taxes" (PILT) legislation providing federal payments to local governments regardless of gross revenues that result from timber harvest and other forest management activities. After revenues from the sale of timber dropped substantially, Congress passed the Secure Rural Schools and Self Determination Act (SRS) in 2000, allowing counties to choose between a payment based on historical average and the 25 percent revenue share. SRS has expired several times, and PILT has been subject to funding uncertainty as well. Western Governors support efforts to ensure counties and states continue to receive payments under the Secure Rural Schools program, and that these payments should be based upon historic federal land management receipts. These payments are vital to providing state and county public goods and services, such as roads, emergency response, and wildlife and natural resources protection in communities adjacent to federal lands.

19. There have been several efforts in Congress to reform federal forest management, and recent legislation reflects the continued frustration of Congress as it attempts to find a path forward to address this issue in a productive, bipartisan manner.

B. GOVERNORS' POLICY STATEMENT

1. Western Governors support sound forest management policies that maintain and promote ecologic, economic and social balance and sustainability.

2. Today, the Forest Service's forest management program is primarily a byproduct of restoration projects intended to reduce wildfire risk and/or improve forest resilience, water quality, watershed health, key wildlife habitat, and/or intrinsic value. Western Governors recognize and support these forest values, but also believe it is reasonable to expect that some portion of the federal landscape will be focused on long-term, ecologically-sound forest management — where jobs, forest products, and revenues are priorities and generated through sound stewardship.

3. Western Governors encourage the Forest Service to develop and help fund new technologies and wood based markets for some non-traditional products. USDA's Forest Products Laboratory is a hub for research and innovation. We should continue to encourage the application of their knowledge and experience in a practical way in the western United States so that some of the federally funded infrastructure that develops from such efforts could first be demonstrated on private lands. Also, since federal forests are now more focused on large landscape forest health projects, there is a good opportunity to ensure we have a broader suite of outlets, in addition to traditional sawmills and existing biomass facilities.

4. We can achieve sustainable forest management across every acre of our federal and nonfederal forestlands while including an equitable mix of uses to meet many ecological, social, and economic needs.

5. Western Governors believe that our citizens are capable of rolling up their sleeves and working together with the federal agencies to address difficult issues such as forest management, and that not enough is done to incent and reward the current collaborative work that is occurring across the West.

6. It is important to retain citizens' rights to question governmental decisions through administrative and legal means. However, there are situations where the threat of litigation is a key factor resulting in either delay of agency activity and progress or the stifling of productive collaborative work. The lack of funding and resources for federal agencies is also a significant factor. Western Governors believe an effort needs to be made to better understand the scope and scale of this problem. There may be an opportunity to further streamline appeals and litigation associated with National Forest decision making in association with other changes designed to incent collaboration and provide more certainty as to outcomes.

7. The 2014 Farm Bill authorities are significant expansions of Forest Service authority and are powerful new tools to boost forest management, promote collaboration, and limit the impacts of administrative objections and litigation. Western Governors encourage federal agencies to fully implement the tools provided in the 2014 Farm Bill.

8. Western Governors are on record as strong supporters of ending the practice of fire borrowing, and Congress should pass legislation to fund federal wildfires off-budget as many states already do, and ensure the Forest Service budget for forest restoration, recreation, road maintenance, hazardous fuels reduction, and wildlife/watershed protection is fully restored.

9. Western Governors believe clear, coordinated and consistent application of federal vegetation management practices is integral to maintaining the health of western forests, preventing dangerous and damaging fires, and maintaining grid reliability. The Governors support effective and efficient cross-jurisdictional coordination that enables utilities to undertake necessary vegetation management actions on federal transmission rights-of-way – and to do so without fear of strict liability imposition for necessary vegetation management actions taken adjacent to transmission rights-of-way.

10. Western Governors are well-suited to engage in a productive and bipartisan dialogue on the broader topic of federal forest management reform, engaging westerners and examining on the ground realities across western landscapes. Western states are land owners and managers and well understand the challenges associated with forest management under changing social, economic and environmental conditions.

11. A meaningful and successful discussion of forestry reform in the West will require a transparent and inclusive process that engages those diverse interests who have a direct stake in forest management outcomes. The impacts of forest management are felt most directly by those who live, work and recreate in and adjacent to those forests, so the discussion needs to begin there. This is perhaps where Western Governors can provide the most productive bipartisan contribution to this national discussion. Our nation's forests belong to all Americans, and in the end and through their elected representation all Americans will determine the scope and success of any efforts to reform forest management.

12. There is significant dissatisfaction in the West among many stakeholders with the current level of National Forest management. There is a general sense that the current level of forest management is not meeting anyone's needs, whether it's putting logs on trucks, protecting water quality, addressing fire risk, protecting key habitats and landscapes, providing for recreation, or other important community needs. Successful forest management reform will achieve a balance among all of these important objectives, and provide the opportunity for certainty such that diverse interests will be encouraged to work together to achieve shared outcomes.

13. It is time to reconsider the business model of the U.S. Forest Service. Western Governors believe it may be possible to reform the Forest Service business model in a manner that reduces project planning costs, sources funds from non-federal partners and recognizes that the agency no longer generates large revenues from commodity programs.

14. Any discussion of forest management reform must include consideration of the financial relationship between the Federal and local governments, the existence of PILT, and the limited tax base for counties with significant federal ownership.

15. Western Governors support the recommendations identified over the course of the WGA National Forest and Rangeland Management Initiative, and incorporate the recommendations into this resolution by reference.

C. GOVERNORS' MANAGEMENT DIRECTIVE

1. The Governors direct the WGA staff, where appropriate, to work with Congressional committees of jurisdiction and the Executive Branch to achieve the objectives of this resolution including funding, subject to the appropriation process, based on a prioritization of needs.

2. Furthermore, the Governors direct WGA staff to develop, as appropriate and timely, detailed annual work plans to advance the policy positions and goals contained in this resolution. Those work plans shall be presented to, and approved by, Western Governors prior to implementation. WGA staff shall keep the Governors informed, on a regular basis, of their progress in implementing approved annual work plans.

Western Governors enact new policy resolutions and amend existing resolutions on a bi-annual basis. Please consult http://www.westgov.org/resolutions for the most current copy of a resolution and a list of all current WGA policy resolutions.

Senate Committee on Environment & Public Works
hearing entitled *"Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions"*
September 27, 2017
Questions for the Record for Ms. Jessica Crowder

Chairman Barrasso:

1. Ms. Crowder, in your testimony you stress updating the National Environmental Policy Act, or NEPA, to ensure adequate consideration of state input. Specifically, you state in regards to NEPA that requiring early outreach to states in the analysis process would reduce the time and resources required to reach a decision. Can you provide examples of projects delayed because of the lack of outreach to states and other entities on a NEPA analysis? How did this result in increased time and resources to arrive at a NEPA decision?

Response:

Clearly, the lack of outreach or delayed outreach to states or other entities has delayed the conclusion of many NEPA analyses. Unfortunately, there are a number of reasons that analyses and subsequent Records of Decisions are delayed, so it is difficult to quantify the level to which this affects project schedules. However, to illustrate the discussion in my written testimony, I have provided examples of delays and examples where outreach has occurred early and often.

Several years ago, the Lander Field Office (LFO) of the Bureau of Land Management (BLM) revised their Resource Management Plan (RMP). While outreach to cooperating agencies did occur early in the process and throughout the process, there was a point during the development of the description of current management that outreach was lacking. The description of the current management situation is important in determining baseline data and evaluating necessary changes. Because of the lack of outreach during this period, cooperating agencies, including state agencies, had hundreds of comments on the data used to develop the analysis and the analysis itself. I believe the sheer number of comments from cooperating agencies and the work required to remedy this situation resulted in a lengthened process. Ultimately, the Lander RMP revision did reach completion. The BLM remedied this issue in subsequent RMP revisions. They worked closely with cooperating agencies on the Cody, Worland and Buffalo Field Office's RMP revisions to gather relevant data and provide opportunities for early comments from cooperating agencies.

An example of early engagement with cooperating agencies is occurring on the Medicine Bow National Forest through their Landscape Vegetation Analysis Project. The U.S. Forest Service (USFS) is preparing an Environmental Impact Statement to analyze treatments on insect-infested areas of the Medicine Bow National Forest. Prior to release of the notice of intent and public scoping, the USFS worked with cooperating agencies, including state agencies, local governments and municipalities, to determine where treatments are most needed. The treatments proposed by the USFS are a direct result of those discussions and data submitted by cooperating agencies.

In summary, early engagement of cooperating agencies results in better information upfront and has the potential to reduce timelines to complete a NEPA process overall.

2. Ms. Crowder, as illustrated in an April 2017 U.S. News and World Report article entitled *Thinning Forests Aim to Reduce Fire Risk*, not everyone agrees on what role thinning should play in restoring forests or at what pace and scale it should happen. Proponents see an opportunity in some circumstances to increase the resiliency of forests. Opponents, however, claim that the benefits of actively managing our forests may be outweighed by the harm, or that actively managing our forests is just a give-away to commercial loggers. What are your thoughts on the ability of forest thinning to maintain healthy forests and prevent catastrophic fires?

Response:

Thinning is a useful tool for reducing fuels and improving forest resiliency. Thinning has positive impacts on tree growth and forest health. Removing trees through thinning practices allows space for healthy trees to grow, reducing risk from insects and disease and creating a more resilient forest in a cost effective manner. Thinning can also be used to reduce ladder fuels – those fuels that cause a fire to spread upward to the crown. Crown fires are difficult to contain and spread quickly. Efforts to reduce crown fires are likely to help reduce catastrophic wildfires.

As with any vegetative management tool, management goals and existing conditions for a particular area must be considered when planning a thinning project or any other forest vegetative management project. The appropriate tool, or suite of tools, should then be applied to reach management goals.

Ranking Member Carper:

3. Throughout the course of our hearing, you all mentioned that you would like to see expanded use of the Collaborative Forest Landscape Restoration Program. What can Congress, federal agencies and/or industries do to help bolster national forest collaboratives?

Response:

There are no Collaborative Forest Landscape Restoration Program (CFLRP) projects in Wyoming. However, the CFLRP provides a general framework that has been used in Wyoming to develop recommendations for forest management. Through adopting and implementing some of the general principles of the CFLRP, we can support collaborative processes and improve active forest management.

The CFLRP funds landscape scale projects. The concept of planning projects across a landscape is important for those forests that require restoration at a large scale and require fuels reduction projects to reduce the threat of severe wildfires. The benefits from landscape scale forest treatments are many – from wildlife habitat to clean drinking water– and it should be a priority

for Congress, federal agencies, industries, state and local governments and other stakeholders to work towards improving forest health to obtain those benefits.

The CFLRP also requires that proposals be developed and implemented through a collaborative process. Local governments, state governments, private citizens and non-governmental organizations have all worked in Wyoming to use collaborative processes to determine how forests in Wyoming should be managed. Governor Mead's Task Force on Forests recognized the importance of people working together to develop solutions for forest management and provided several recommendations for developing and funding collaboratives. There are several local collaboratives working across Wyoming to develop and implement vegetative treatments. Some of these collaboratives, such as the Sublette County Forest Management Collaborative, have provided recommendations for management to the USFS and are working to find funding to complete appropriate NEPA analyses and implement treatments.

The tools and methods contemplated in the CFLRP are useful and helpful. In Wyoming, we are implementing the principles provided in the CFLRP without the funding provided. I believe funding for implementing necessary landscape scale projects and for implementing projects developed collaboratively must occur with or without the CFLRP.

Senator BARRASSO. Thank you, Ms. Crowder.
Mr. FITE.

STATEMENT OF LAWSON FITE, GENERAL COUNSEL, AMERICAN FOREST RESOURCES COUNCIL

Mr. FITE. Thank you. Chairman Barrasso and Ranking Member Carper, members of the Committee, thank you for the opportunity to address you today.

This hearing is a timely and constructive step toward commonsense reforms in the way that we manage our Federal forests.

The American Forest Resource Council, where I am the General Counsel, represents the forest products industry in Washington, Oregon, Idaho, Montana, and California. Our members' businesses, and the rural communities that they support, depend on a steady and predictable supply of timber. The forest products industry is one of the only sources of family wage jobs in these areas, and these jobs are the linchpin of many rural economies. The milling and logging infrastructure that our industry provides also makes forest restoration and thinning efforts possible.

We in the forest products industry take pride in our stewardship of the lands where we work. We are invested in sustaining this renewable resource for future generations, protecting our communities, and ensuring the health of our forests so it will offer its benefits to the many users who work, fish, hunt, and recreate there.

Right now, swaths of our Federal forests are overstocked, unhealthy, and at high risk of catastrophic wildfire. As you have heard during this hearing, this year's wildfire season in the West was one of the worst on record: over 8 million acres burned. The effects of these wildfires are not mere statistics; they are human suffering, burned homes, destroyed and charred wildlife habitat, and burned dead forests. And when forests burn, valuable timber resources are lost, leading to job loss and closure of that needed mill and logging infrastructure.

Many of these risks were illustrated in dramatic fashion by the Eagle Creek fire just east of Portland. This fire took weeks to contain, it threatened key area water sources and gravely damaged treasured recreational sites such as Multnomah Falls and the Angel's Rest Trail. It covered the entire Portland area with a thick blanket of smoke.

On September 17th, Portland had the worst air quality in the entire Country. Portland public schools canceled their first day of kindergarten this year. My daughter's preschool, they have gone outside every day for 30 years, and this year they had to stay inside for several days because of the poor air quality from this wildfire.

Fortunately, there are solutions that can increase the resilience of our forests and our rural communities. The legislation before you today makes great strides toward streamlining forest management and reducing artificial constraints on land management agencies. In particular, S. 605, the Litigation Relief for Forest Management and Projects Act, which is a bipartisan bill and a bicameral bipartisan bill, would fix the Ninth Circuit's disastrous Cottonwood decision which is currently stalling a wide range of needed projects across 11 national forests. The bill would fix the decision by adopt-

ing the position taken by the Obama administration in front of the Ninth Circuit and in a petition to the Supreme Court.

In Cottonwood, the Ninth Circuit ruled that when a new species is listed or new critical habitat designated, it is not enough to consult on that species for a project that is underway; it ruled that the Forest Service had to go back and redo its plan level consultation, even for a forest plan that may be 20 or more years old. In the Northwest, in particular, we are operating under a series of forest plans adopted in 1994.

This plan level consultation offers no conservation benefit over a project level consultation because plan level consultations often include a broad level of acceptable impact that can be spread over many projects. But when projects are analyzed project by project, a buffer is more likely to be incorporated to ensure those projects do not adversely affect listed species.

Cottonwood has had a dramatic effect on the ability of Region I of the Forest Service to manage its lands, and that is only the beginning.

In addition to S. 605, both S. 1417 and S. 1731 are worthy of your considerations. Currently, there are too many roadblocks and too much analysis paralysis going on in managing our Federal forests. Solutions to these problems can be achieved here in Washington, DC, and we urge the Committee to act.

[The prepared statement of Mr. Fite follows:]

Testimony for The Senate Committee on Environment and Public Works
Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions

September 27, 2017

Lawson Fite, General Counsel
American Forest Resource Council

Thank you for the opportunity to address the Committee on Environment and Public Works regarding urgently needed reforms to allow for effective management of our federal forests. Speedy action by Congress to enable active forest management is the best defense against a future of catastrophic wildfire.

The American Forest Resource Council (AFRC) is a non-profit trade association that represents manufacturers, mill workers, loggers, and private forest landowners in five Western States: Montana, Idaho, Washington, Oregon, and California. Our members care deeply about the health and sustainability of public forestlands, on which their businesses and communities depend. The forest products industry is the lifeblood of many rural communities throughout the West. In many of these areas, logging or milling is the only plentiful source of family-wage jobs, particularly for workers without college degrees. These blue-collar middle-class jobs bring the American dream to rural communities throughout the Nation.

My remarks will focus on the need to conduct more robust active management of federal forests to address the wildfire crisis and ensure stability of rural communities. The forest products industry strongly supports efforts by Senators from both sides of the aisle to streamline the planning process and alleviate litigation roadblocks. The legislation discussed at this hearing is a vital component of these efforts. The Litigation Relief for Forest Management Projects Act, S. 605, sponsored by Senators Daines (R-MT) and Tester (D-MT), would enact the Obama Administration's position to fix a misguided and disastrous court decision that is holding up management activities in nearly a dozen National Forests. Senator Thune's (R-SD) Forest Management Improvement Act of 2017, S. 1731, would give the Forest Service the tools it needs to address forest management where it is most needed, while also providing innovative litigation solutions. Senators Hatch (R-UT) and Heinrich (D-NM) have teamed together to sponsor the Sage-Grouse and Mule Deer Habitat Conservation and Restoration Act, S. 1417, which enables a broad-based restoration strategy in key wildlife habitat.

I. *Federal Forests Urgently Need Active Management*

In the West, this year's wildfire season has been one of the worst on record. It started earlier and fire activity is far above average. Nearly nine million acres have already burned. Portland and Seattle have both been covered in smoke for days on end, with ash falling in the streets, schools cancelled, children huddled inside, and health-sensitive individuals suffering distress. Across the country, nearly 4.5 million homes are at risk from wildfire.

The Eagle Creek Fire burned over 40,000 acres just east of Portland, including some very popular and scenic hiking spots in the Columbia River Gorge. Over one hundred hikers were

trapped behind the fire and had to be rescued. The fire started in a Scenic Area where active management is prohibited, and spread to a Wilderness Area where no mechanical work, including active timber management, is allowed. Driven by Gorge winds, the fire expanded rapidly in its first few days, even jumping the Columbia River into Washington. Many local schools cancelled classes, and Portland Public Schools cancelled the first day of kindergarten. Outdoor activities were curtailed across the region, from football games to track meets. When the fire flared up again on September 17, Portland recorded the worst air quality *in the country*. And the worst five locations in air quality were all in Oregon.

This fire opened city residents' eyes to the experiences of rural residents. Over the past several years, catastrophic fires have burned repeatedly in the rural west, unleashing devastation over hundreds of square miles. Near Brookings, Oregon, the Chetco Bar Fire burned nearly 190,000 acres – an area four times the size of the District of Columbia. This fire started in a Wilderness Area where active management is prohibited, so the Forest Service did not immediately move to suppress it. The fire grew and spread to nearby federal lands. After burning for over two months, it was only 53% contained as of mid-September, at a cost to taxpayers of over $57 million. This fire caused the ash clouds and haze to cover the coastal town of Brookings.

Catastrophic fires are the result of decades of fire suppression, coupled with unprecedented fuel buildups due to a lack of forest management activity. These catastrophic fires destroy valuable timber resources but also degrade many of the other uses of healthy forests. In one 2014 fire, nearly 20,000 acres of high-quality northern spotted owl habitat burned. In fact, over the past two decades, wildfire has become the greatest source of habitat loss for the northern spotted owl. Between 1995 and 2015, according to the Forest Service, habitat impact attributed to wildfire was *ten times* the impact from timber harvest. Since 2015, wildfire impacts have only worsened.

There is scientific consensus that active management decreases forest fire extent, severity, and impacts. An actively-managed forest will exhibit fire behavior more consistent with the historic role of fire in forested ecosystems. Owing to this scientific consensus, many groups—including environmental organizations—have changed their positions on active management, at least in the roaded "front-country." At AFRC, we are deeply involved in collaborative efforts with such groups, and our attorneys are representing collaborative groups in litigation throughout the West. Following the science, projects developed in collaboration between industry, environmental groups, recreational users, local government, and others have made significant strides in forest restoration. But more is needed.

Some deny the fire science because it conflicts with their ideology. They deny that these fires are actually catastrophic, or they point to climate change to deny that fuel buildup plays any role in fire intensification. Climate change is certainly a factor, but it is not working alone. It is not an either/or question. Warmer climate combines with overstocked, stressed, kindling-like forests to create firestorms that outpace anything the country has seen in living memory. It is no coincidence that over 90% of the burned acres in Oregon this year were on Forest Service lands which comprise just over 50% of Oregon's forestland and where active management is nearly at a standstill. The state and federal government have about equal amounts of land in Oregon, and experience equal numbers of fire starts. But burned areas are overwhelmingly concentrated on

Forest Service lands. Active management will make these federal forests more resilient to these extreme events.

Attached to this testimony are two photographs demonstrating how active management can work. The photographs were taken in the same spot, facing different directions, by AFRC's field forester. Both areas were affected by the National Fire on the Umpqua and Rogue-Siskiyou National Forests in southern Oregon. The first photograph shows where thinning occurred in the "D-Bug" project. There, the fire crept on the ground and left the overstory intact. The fire crews were able to hold the fire south of Oregon Highway 230 in these thinning units. The second photograph, taken from the same spot in the other direction, is 100% black in the overstory and understory—this is where thinning did not occur. This is a stark demonstration of how active management can restore the historic role of fire.

Unfortunately, there are too many bureaucratic and legislative roadblocks tying land managers' hands. Because of these roadblocks, forests have been burning before they have been treated. At least three major projects have been planned in recent years which burned before implementation. The 2014 Johnson Bar Fire in Idaho burned the area of an in-progress collaborative restoration project; when the Forest Service attempted to build on that work to conduct post-fire work. Yet a fringe group sued and obtained an injunction- resulting in the closure of a sawmill in Orofino, Idaho. In 2016, the Pioneer Fire destroyed the area of the Becker Project on the Boise National Forest, putting a whole year's timber volume for southern Idaho at risk and resulting in severe environmental and recreational impacts. To its credit, the Forest Service used all available tools and put two post-fire projects together in only nine months. However, those projects are the subject of threatened litigation under the Ninth Circuit's mistaken *Cottonwood* decision. The Stonewall project on the Helena-Lewis & Clark National Forest is a true cautionary tale. After a fringe group sued, the district court, acting under the *Cottonwood* decision, issued an injunction. The court noted that an injunction would be a "wise course" because "the risk of fire is not imminent." Mere months later, the project began burning in the 18,000-acre Park Creek Fire, which was contained only after expenditures of over $10 million in suppression costs.

We need common-sense reforms to lighten the burden of redundant administrative process and continuous litigation. Forestry is traditionally an area of bipartisan progress, and it still can be. There are a number of measures with support from Republicans and Democrats, environmentalists and industry. The Committee should take quick action to advance forestry reform legislation to give us the best chance to mitigate future wildfire seasons.

II. *S. 605 (Daines/Tester) Would Fix the Disastrous* Cottonwood *Decision*

The Litigation Relief for Forest Management Projects Act (S.605) is a bipartisan, bicameral measure that merely seeks to enact the Obama Administration's position on procedures under the Endangered Species Act (ESA). S. 605 would eliminate a judicially-imposed paperwork requirement that is at odds with the ESA, a requirement that offers no conservation benefit. The Committee should move quickly to advance S. 605 and report it favorably to the Senate floor. A companion bill is pending in the House, with bipartisan sponsors including Reps. Mike Simpson (R-ID) and Collin Peterson (D-MN). It is no surprise that this common-sense legislation has

attracted the support of lawmakers from both parties, from state and local governments, and prominent environmental groups including Trout Unlimited and the National Wildlife Federation. AFRC offers the strongest possible support, as do many industry groups including Intermountain Forestry Association, Montana Wood Products Association, California Forestry Association, and Federal Forest Resource Coalition.

In brief, S. 605 will allow projects to move forward under existing forest plans if an appropriate plan-level ESA consultation is completed. It will eliminate any requirement for the Forest Service or Bureau of Land Management to *reinitiate* consultation due to new ESA listings or critical habitat at the plan level—and only at the plan level. The bill does not change existing law regarding applicable requirements to consult on individual projects, new forest plans or plan revisions. The Ninth Circuit requires consultation on new plans, while the Tenth Circuit does not. S. 605 leaves this circuit split in place.

ESA consultation issues play a significant role in federal forest management. AFRC supports the goal of the ESA, which is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. ..." 16 U.S.C. § 1531(b). The ESA requires an agency to avoid undertaking any action that would be "likely to jeopardize the continued existence" of a listed species. 16 U.S.C. § 1536(a)(2). Agencies must also avoid "adverse modification" of critical habitat. These requirements allow negative effects on species or critical habitat, so long as those negative effects do not appreciably reduce the likelihood of survival or recovery of the species. If an action is deemed "not likely to adversely affect" species, a full consultation is not required. Consultation usually culminates in a biological opinion from the Fish & Wildlife Service.

The Ninth Circuit requires a land management agency to consult on its management plans (forest plans) and obtain a plan-level biological opinion. *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, (9th Cir. 1994). The Tenth Circuit doesn't require any plan-level consultation. *Forest Guardians v. Forsgren*, 478 F.3d 1149 (10th Cir. 2007). We believe the Tenth Circuit has the better argument (and the Obama Administration agreed, as it asked the Supreme Court to review the issue). Forest plans do not authorize or implement any ground-disturbing activity. Instead, they set a series of land classifications, management standards and guidelines, and management goals. For that reason, the Tenth Circuit concluded that a forest plan is not concrete enough to constitute agency "action" subject to the ESA. This "circuit split" regarding initial forest plan consultation is left in place by S. 605.

Unfortunately, the Ninth Circuit has gone even farther. In *Cottonwood Environmental Law Center v. U.S. Forest Service*, 789 F.3d 1075 (9th Cir. 2015), the Ninth Circuit ruled that the Forest Service had to re-do consultation at the *Forest Plan level* for 11 National Forests after designation of critical habitat for lynx throughout the region. It says that a completed forest plan is still an action in progress, so the Forest Service has to re-do its ESA compliance on an entire region when a new species is listed or new critical habitat is designated. Following *Cottonwood*, district courts are beginning to hold up projects, such as Stonewall, to wait for the full plan-level consultation.

In Forest Service Region 1, where most of the affected forests are, projects involving over 291 million board feet (MMBF) of timber are in litigation, the vast majority *Cottonwood*-related. And 151 MMBF is under an injunction, including 50 MMBF under contract. These projects also have substantial conservation benefits, such as fish passage improvement and habitat restoration, many of which are financed through timber revenues. *Cottonwood* is holding communities and ecosystems hostage. Although impacts are currently focused on Montana, there is significant danger that *Cottonwood* will expand like fire. Cases are currently pending regarding forests in Idaho and Ohio, and one was recently dismissed regarding the Superior National Forest in Minnesota.

The Obama Administration, including Secretary Vilsack, asked the Supreme Court to review *Cottonwood* in 2016, but was denied. That fall, the Forest Service began the arduous process of consulting on 11 National Forests and more than 35,000 square miles of lynx habitat. This July, the Forest Service completed its biological assessment—the first piece of the consultation process. It is unclear when a biological opinion will be complete at the plan level. Then, project-level analyses will have to be reviewed against the plan-level opinion. This process will not be completed in 2017 and will likely stretch well into the 2018 forest management operating season. Of course, each step will be subject to multiplying lawsuits and injunctions.

Since nearly every forestry project already undergoes ESA consultation, this plan-level exercise has no real conservation benefit. A plan-level analysis generally assesses an amount of species-wide impact that is sustainable. Projects can proceed as long as their impacts fall within the plan-level approved impacts. When a project is evaluated without plan-level clearance, there is no such buffer for the agency to rely on. Therefore, ESA consultation at the project-specific level is likely to be more conservative.

S. 605 simply and directly fixes *Cottonwood*. It provides that re-initiation of plan-level consultation is not required due to a new species listing or critical habitat designation. It does not affect any *applicable* requirement to consult on a new plan or a significant plan revision. The bill applies to both the Forest Service and the BLM, which each manage significant forestlands.

The extreme effect of *Cottonwood* is illustrated by the East Reservoir Project on the Kootenai National Forest. This project has strong support of the Kootenai Forest Stakeholders Coalition, a collaborative group including timber companies, local government, and several environmental groups. I am representing the Coalition and Lincoln County in the case. The Coalition put a lot of work into the project, including pushing for changes that reduced impacts on lynx habitat. Still, a fringe group sued. The district court found that even under *Cottonwood* the project could move forward. But in September of last year, the Ninth Circuit halted all commercial harvest in the project, and it remains stalled pending a further decision. It has now been seven months since the case was argued, and over a year since the injunction was issued. If a collaboratively-supported restorative project that is not likely to affect species cannot make it through the process without an injunction, the process needs to be changed.

III. *S. 1417 (Hatch/Heinrich) and S. 1731 (Sen. Thune) Would Streamline Processes that Are Holding Back Active Management*

S. 1417 and S. 1731 both contain important ideas for forestry reform and deserve strong consideration. Both bills establish a set of categorical exclusions which streamline compliance with the National Environmental Policy Act (NEPA). A categorical exclusion (CE) allows the agency to implement a project without producing an Environmental Assessment (EA) or Environmental Impact Statement (EIS). This results in significant efficiencies in planning resources. While implementing a CE rarely takes more than six months, a typical EA takes three times as long, according to a 2014 report from the Government Accountability Office. The same report found an EIS can take nearly five years on average. It is no wonder that the Forest Service spends an estimated $350 million annually satisfying environmental analysis and paperwork requirements.

S. 1417 is focused on specific habitat needs for mule deer and sage grouse. This habitat restoration work could produce significant improvements in forest health, and wildfire resistance, while also producing some positive economic impact, chiefly in the Four Corners States.

S. 1731 would establish a series of CEs from various forest health perspectives and tools, including early seral habitat, thinning projects, wildlife habitat improvement, and salvage of dead trees after a fire, wind or other event. This gives the Forest Service (and BLM) a full suite of tools to deploy in an expedited fashion in the manner they deem wisest. Although the agencies aren't perfect, Congress created them for the purpose of deploying forestry expertise across the landscape. S. 1731 actually gives them the ability to do what Congress has directed them to do.

S. 1731 builds on past successes from the 2014 Farm Bill. It amends the Good Neighbor Authority (GNA) to remove the prohibition on road maintenance and reconstruction activities associated with forest restoration projects – a critical correction. GNA allows states to deploy resources and expertise to help the Forest Service or BLM expand its forest restoration activities, but the road prohibition has limited the effectiveness of this tool. Many states, particularly Idaho and Wisconsin, are establishing innovative and self-funding programs that expand the forest management footprint without requiring additional federal tax dollars. S. 1731 also expands the scope of the Farm Bill CE from 3,000 to 10,000 acres. This CE has become an extremely valuable tool for addressing the forest health crisis nationwide. AFRC is involved with one of the first legal challenges to a project using the Farm Bill CE. We prevailed in the district court and are hopeful that success continues.

S. 1731 has two other very important provisions. In section 4, it streamlines the number of alternatives to be considered in EAs or EISs for forest management projects. This would greatly improve efficiency of forest management. Alternative development is a significant draw of agency time and resources. The extent of "reasonable" alternatives is frequent ground for litigation. By placing limits on the number of alternatives, the bill streamlines the process and creates certainty about what NEPA requires. Too often, agencies will do *more* than they sincerely believe is required, simply to "litigation-proof" a project. We cannot afford to be wasting taxpayer dollars and agency resources like this.

The Forest Management Improvement Act also establishes a pilot arbitration program for forestry projects. This could greatly reduce the litigation burden on forest management. The bill gives the Forest Service discretion to develop the pilot program. Arbitration is a much quicker way to allow for review of projects. It would be easy to design a program whereby a final, binding decision is issued on a project within 90 days. Contrast this with ordinary litigation, where the time from project issuance to final litigation decision is measured in years.

Many states have adopted mandatory arbitration systems for cases such as car accidents, and contracts often provide for required arbitration. The Federal Arbitration Act, 9 U.S.C. §§ 1 *et seq.* (FAA), establishes a federal policy in favor of arbitration. The FAA does not establish specific requirements for arbitration, but provides that private arbitration agreements will be enforced. States and arbitration bodies usually provide that arbitrators must be neutral and must make disclosures to avoid any conflict of interest. They often also rely on senior attorneys or retired judges. Thus, any arbitration program should ensure neutrality and provide guidance on the selection of arbitrators (such as approving retired federal or state court judges). It should also deal with cost allocation, since arbitration can be significantly more expensive for the parties. Ideally, the government would compensate the arbitrators. Arbitrators' fees could also be subject to prevailing-party status. Arbitration should be established with required timelines, such as a final decision within 90 days that is not appealable. A well-designed program allows for effective review and certainty without the great delays and expense that are now so widespread.

IV. *Conclusion*

The legislative solutions before you can mitigate the horrific effects of catastrophic fire and restore the health of forests and rural communities. As Senator Daines eloquently said, either we will manage our forests, or they will manage us. Now is the time for Congress to make effective active management a reality.

Senate Committee on Environment & Public Works
hearing entitled *"Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions"*
September 27, 2017

* * *

Responses to Questions for the Record by Lawson Fite
General Counsel, American Forest Resource Council
Portland, Oregon

Chairman Barrasso:

1. Mr. Fite, you claim that there is scientific consensus that active forest management decreases forest fire extent, severity, and impacts. An actively-managed forest will exhibit fire behavior more consistent with the historic role of fire in forested ecosystems. Can you explain why this is the case to this committee?

   Response: Absolutely. The short answer is that active management reduces fuel levels and returns fire intensity to its natural range.

   Our federal forests are a prime example of this phenomenon, particularly in drier forest types. For the last 20-plus years, federal forests have seen little active management. In addition, for the prior several decades, federal land management agencies had a policy of suppressing nearly every fire which occurred on the landscape. This combination–a lack of active management and suppression of lower-severity fires–means that the amount of fuel on the landscape continues to grow. With more fuels, a fire now will burn at higher severity and longer duration than the historic norm. These catastrophic fires kill even fire-resistant older trees, because of the overstocked landscape and the presence of ladder fuels. In contrast, a fire will generally "lie down" once it reaches an actively managed forest—it will burn the underbrush and through the forest at a moderate severity. Thus, active management restores the role of fire as an agent of regeneration rather than one of destruction.

2. Mr. Fite, in your written testimony, you asserted that the Forest Service spends $350 million annually on environmental analyses and paperwork and that agencies frequently go beyond NEPA's requirements in order to make their projects litigation-proof. Some parties think that it is necessary to always have the most extensive environmental analyses possible for a forest management project. You seem to disagree, as you have said this padding of the record has led to the wasting taxpayer dollars and agency resources. Can you explain what you mean?

   Response: It is always possible to have more environmental analysis of any action. But the purpose of NEPA is not to have the most extensive environmental analysis possible. It is to ensure that decision-makers are adequately informed of the environmental consequences of their decisions. Attempting to litigation-proof documents results in documents that are actually less useful for NEPA's purposes; they are encyclopedic rather than analytic. As guidance from Obama Administration's Council on Environmental Quality stated: "NEPA

encourages *straightforward* and *concise* reviews and documentation that are *proportionate* to potential impacts and *effectively* convey the *relevant* considerations to the public and decisionmakers in a *timely* manner while rigorously addressing the issues presented." (emphasis added).

Documents that are too long and detailed can result in poorer decisions because they obscure the issues that are truly important. They also often introduce new issues for litigation. In both instances, the time and resources spent doing unnecessary additional analysis is wasted.

It is important also to be aware of opportunity cost. An agency may feel the need to over-analyze two projects. With those same resources, it could have produced four or five appropriately-analyzed projects. These slowdowns lead to significant adverse consequences in the forestry arena. There is less timber volume available, and it is less predictable, meaning it is harder for industry to invest in infrastructure. Less infrastructure and less investment, of course, leads to fewer jobs and less stable communities. Ultimately, we lose the milling and logging capacity, which often makes forest health treatments cost prohibitive due to the loss of markets for the byproducts of thinning projects.

The opportunity cost hits the landscape too. Important projects get delayed by over-analysis and then a catastrophe hits. I am aware of at least three instances in recent years where project areas planned for active management burned before they could be treated. In one case, the Forest Service spent six years preparing an EIS for the "Stonewall" project, only for the project to be halted in court and the area to burn only a few months later.

3. Mr. Fite, as illustrated in an April 2017 U.S. News and World Report article entitled *Thinning Forests Aim to Reduce Fire Risk*, not everyone agrees on what role thinning should play in restoring forests or at what pace and scale it should happen. Proponents, such as the Nature Conservancy, see an opportunity in some circumstances to increase the resiliency of forests. Opponents, however, claim that the benefits of actively managing our forests may be outweighed by the harm, or that actively managing our forests is just a give-away to commercial loggers. What are your thoughts on the ability of forest thinning to maintain healthy forests and prevent catastrophic fires?

   Response: There is no question that forest thinning is an essential component of maintaining healthy forests and reducing the risk of catastrophic fire. Fire has three elements: fuel, oxygen, and heat. Of those we have the most influence over fuels through thinning and other treatments. According to data from The Nature Conservancy, for example, over 5 million acres of forest *in Idaho alone* can benefit from treatments such as thinning. This scientific consensus is part of why people of good faith in both parties have come together to support active management. It is why legislation such as S.605, S.1731, and S.1417 is so important.

   To those who claim active management is a "give-away" to commercial loggers, they need to think hard about whether we want resilient forest producing renewable materials or a burned-out landscape. Our forests need help from active management and our communities need help from predictable supplies of timber and the rural family-wage jobs the forest products industry provides. Our nation also demands wood products for buildings and other uses.

Wood products are a carbon-friendly building material that we can produce domestically under some of the most stringent environmental protection in the whole world. Or, we can import these materials from other counties with far less stringent environmental rules. Actively managed forests and wood products are a true win-win-win opportunity.

Ranking Member Carper:

4. Throughout the course of our hearing, you all mentioned that you would like to see expanded use of the Collaborative Forest Landscape Restoration Program. What can Congress, federal agencies and/or industries do to help bolster national forest collaboratives?

   Response: Collaboratives, particularly those receiving project funding through the CFLRP, can be an effective way to design and support good projects that actively manage our forests. Industry is giving substantial support to these efforts. Our foresters participate on the ground in collaborative meetings and help design projects. Industry participants are willing to compromise when there is potential for a good result. And industry has contributed legal support. In fact, I have represented several collaboratives in court cases regarding their projects—at no cost to the collaboratives or their members.

   In many areas of the country, particularly Idaho, eastern Washington, and Montana, collaboration allows former adversaries to come together and reach consensus. Still, fringe groups will litigate projects and have succeeded in stopping a few projects that have collaborative support. This is profoundly demoralizing to collaborative participants and undermines the whole effort. In those instances, Congress needs to provide litigation protection by reducing attorney fee awards or preventing injunctions from being issued.

   The issue is a little more difficult in places, such as western Oregon, where collaboratives are not as successful. In several cases, collaborative members in Oregon have walked out and filed lawsuits when the collaborative process did not give them everything they wanted. Here, agencies need to stand their ground, and Congress needs to provide litigation protection.

5. In response to a question regarding the most needed change to federal management policy to address wildfires, you stated "simply a focus on actively managing our landscape." Do you believe the U.S. Forest Service will be able to better actively manage its lands if Congress addresses the agency's fire borrowing problem?

   Response: Addressing fire borrowing would help, but it will not fix the underlying problem, which is that the land management agencies do not have the ability to effectively address the burgeoning forest crisis at anything approaching sufficient speed. The Forest Service is currently forced to devote too much time and money to NEPA compliance. A 2014 GAO report (http://www.gao.gov/assets/670/662543.pdf) found that the Forest Service completed more Environmental Impact Statements (EISs)–which are typically reserved for the largest, most complex actions–than any other federal agency. This makes little sense considering the relatively known, minor, and temporary impacts of forest thinning projects.

The problem continues to get worse, despite the increased focus on collaboration and the need for restoration. In fact, according to the Forest Service, the average EIS now takes the agency 1,373 days—up from 817 a decade ago. An Environmental Assessment now takes 730 days, while a Categorical Exclusion now takes 183 days. The associated cost of preparing these documents continues to climb.

Without common-sense management reforms, such as those in S.605 fixing the erroneous *Cottonwood* decision and efforts to streamline NEPA for routine forestry projects, Congress will simply be asked to throw money at the problem again and again. As Mr. O'Mara said at the hearing, by coupling reforms and funding Congress can create a double win for natural resource stakeholders.

October 26, 2017

Senator BARRASSO. Thank you very much, Mr. Fite, for your testimony.

Mr. O'Mara, welcome back.

STATEMENT OF COLLIN O'MARA, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NATIONAL WILDLIFE FEDERATION

Mr. O'Mara. Chairman Barrasso, Ranking Member Carper, thank you for the invitation to be with you all. I am so thankfully to you personally, Mr. Chairman, for holding this hearing. This is a crisis that has not received nearly the attention nationally that it should; it has been drowned out in the news. And when you look at 8.5 million acres of wildfire this year, it is a big number. There are a million acres burning right now, which is the same size as, Senator Carper, my State of Delaware. Eight of the worst years in wildfire history have been the last 15. I mean, this is a trend that is absolutely terrifying. And there are solutions that have gone up to the two yard line in the last several congresses, but haven't quite gotten kind of across into the end zone.

I want to be clear from the beginning that fire is natural. There are absolutely appropriate uses of fire, prescribed burns, very appropriate management technique. That is not what we are talking about today. These megafires that we are seeing are unlike anything we have really ever seen before, and they are more intense, they are more frequent.

And the thing that is scary for me is that this year we actually had a decent snowpack in a lot of places. So the summer was just so hot after that basically all the additional precipitation that we had wasn't enough to increase the soil health, and you still had these massive fires.

So you can't ignore the climate impacts between the snowpack and the warmer springs and the longer, drier summers, but there are things we can do about it, and right now the Forest Service is estimating that between 65 and 82 million acres of forests of the 193 million acres in our national forest system require restoration. We are only restoring a fraction of that. And for this conversation I think it is absolutely imperative that we both link the management improvements that are absolutely possible with this funding crisis, because we can have all the tools in the world for our guys on the ground, and they are doing the best they can with the tools they have, but if there are no resources to actually restore these forest stands, it will all be for naught.

So there is a bipartisan path forward. There was a bill introduced just a few days ago by Senator Crapo, with Senator Wyden, Senator Merkley is on it as well; a huge bipartisan coalition of folks. But we would really encourage that this conversation be tied to that conversation because, at the end of the day, if we don't fix this fire funding crisis, a lot of these tools we are talking about will be insufficient.

And we have talked about half of the Forest Service budget going toward fighting fires. We are going to be over 60 percent this year, and pushing up to two-thirds, 65 percent in the next few years.

At the same time, we absolutely can improve forest management, and there are commonsense things we can do. We should be pushing innovation and collaborative tools. We should be focusing on

restoration, on habitat restoration in particular. We need to make sure that forests and wildlife health and watershed health are adequately considered. And we can also improve the efficiency of the way that we look at these tools while maintaining public input and collaboration and environmental safeguards.

And before this Committee today you have two bills that are great examples of reaching this balance. Senator Hatch and Senator Heinrich's sage brush bill is a good start. It is a bill that is targeted on a very specific problem, the juniper encroachment and looking at some of these other invasive species. It is targeted. It requires there be a habitat benefit. It addresses multiple threats, and it has incredible bipartisan support.

The thing about this bill that is interesting is that you have support from almost all the conservation groups; you have support from industry groups like the American Petroleum Institute, the NRA. There are some conversations folks want to have about a couple small pieces. Some folks are concerned that invasives could come if you create a lot more roads and you could have some unintended consequences. But it is a great bipartisan bill that we strongly support.

Senator Daines and Senator Tester talked about the Cottonwood bill. Again, huge bipartisan support; great broad coalition of folks. Again, there are a few small pieces that some groups want to talk about. I think there is a collaborative process we can have between now and markup to have that conversation, but, again, something that has big bipartisan support that makes a lot of sense.

I also agree with Senator Thune that a lot of the concerns that he has raised are things that we need to address. I think his bill goes a little too far in some places, and we would like to work with the committee to ratchet it back a little bit. I think there are a couple places where we should have more collaboration and really empower local communities. I think some environmental safeguards that are kind of stepped by the wayside that, frankly, could be kept in place and still be more efficient.

But, again, these are conversations that are timely and you could have a big bipartisan win at a time in this chamber where I think bipartisanship is fairly rare. You could have a massive, massive bipartisan victory in the next 2 months using these bills before this Committee as a basis and combining Senator Crapo's work on the other side.

So, for me, at the end of the day, if we can put forward a package that solves the wildfire funding crisis, finally, that we have been talking about for 4 years, adopts landscape scale approaches, the Nature Conservancy has been doing good work on this; if we can actually reduce some of these redundant environmental reviews in a way that still protects the integrity, but actually increases efficiency; if we reward collaboration—there is nothing more frustrating for folks than to participate in a process for years, finding good commonsense bipartisan solutions, nonpartisan solutions and have them blown up by litigation later—and then expanding and improving these Good Neighbor and stewardship contracting provisions, we could have an absolute homerun and actually address a major problem on the landscape in a big way.

So, on behalf of the National Wildlife Federation, our 6 million members, our 51 State affiliates, State and territorial affiliates, thank you for working on this issue because I think this is one of those opportunities that could be government at its best over the next couple months if we put our heads and actually get something big done. So thank you to Mr. Chairman and Mr. Carper.

[The prepared statement of Mr. O'Mara follows:]

Statement of Collin O'Mara
President and CEO of the National Wildlife Federation
Before the Senate Committee on Environment and Public Works
Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions
Wednesday, September 27, 2017

I. Welcome & Introduction

Chairman Barrasso, Ranking Member Carper, and Members of the Committee,

Thank you for the opportunity to testify before you today on the important issue of legislative solutions to address the raging forest fires on our public lands. I am here today on behalf of the National Wildlife Federation and our nearly 6 million members and supporters, and our 51 state and territorial affiliates. Our members are hunters, hikers, anglers, gardeners, bird and wildlife watchers, foresters, farmers – everyone who cares about wildlife.

2017 is shaping up to be among the worst wildfire seasons in our nation's history. The impacts on local communities and our wildlife and natural resources have been devastating and widespread. I want to express our deepest sympathies for the firefighters who lost their lives battling one of the many wildfires burning in this record fire season. I also want to express our support for everyone impacted by wildfires. Local communities have lost countless buildings and suffered tens of billions of dollars in damages. Waterways and numerous habitat types have been degraded, imperiling wildlife. Smoke disrupted lives in downtown Portland, outdoor recreation businesses in Missoula, and affected the air children breathe from San Diego to Jackson. Tens of millions of tons of climate-altering carbon dioxide have been released.

Our efforts to overcome the wildlife crisis in America are also impacted. Our vision is to *"Increase America's fish and wildlife populations over the next generation, enhancing their capacity to thrive in a rapidly changing world."* There is already a systemic decline in many fish and wildlife populations in the United States, largely driven by habitat loss and degradation. Nearly one-fifth of native forest animal species are at risk, with many others exhibiting long-term population declines.

Given the changing conditions of our forest landscape, stemming the decline in wildlife populations will increasingly require restoration and climate-informed forest management. The factors leading to wildlife population and habitat declines will likely increase in future years as climate change and other large-scale threats come to bear on U.S. habitats and ecosystems. Both wildlife and people depend on improved forest health for a variety of benefits and services including clean and abundant water. Furthermore, healthy forests are increasingly important to limit the worst consequences of climate change by removing carbon dioxide naturally from the atmosphere.

II. Wildfire Crisis and Opportunity

In much of the West, the trend toward increasingly large-scale disturbances from mega-fires, prolonged droughts, and widespread pest outbreaks makes the wildlife crisis worse by stressing many of our forest habitats and pushing them beyond the bounds of historical conditions.

Wildfires are a natural occurrence and are essential for the long-term health of ecosystems, and in many parts of the country, fire can be a vital tool for healthy forest management. In recent years, however, wildfires have been burning more intensely and frequently than in previous decades, a trend that is linked to less snowpack, warmer springs, an expansion of summer dry periods, and outbreaks of injurious species, like bark beetles.[i] In 2017 alone, well over 8.5 million acres of wildfires have burned in the United States. Six western states had the largest or most destructive fires in the past six years. Exacerbating this situation are conditions brought by severe drought, where for example, California has over 100 million dead trees, as well as widespread outbreaks of pests, such as bark beetles, currently affecting approximately 32 million acres of National Forests.

With massive fires continuing to cover the West, experts are starting to observe some frightening trends. The area of forest burned every year in the Pacific Northwest has increased by nearly 5,000 percent since the early 1970s, and the area burned in the Southwest has increased by nearly 1,200 percent[ii, iii]. The average wildfire season is 78 days longer than it used to be.[iv]

When wildfires burn so hot and so often, natural landscapes are often unable to rebound like they would under their natural fire regime. As an example, in 2011 the Las Conchas fire in New Mexico burned more than 156,000 acres of forest and scrubland, one of the largest fires in the state's history. The fire burned so intensely that only bare dirt and tree stumps were left in many places, and some burned areas may be permanently affected.[v,vi]

Federal Budget Problems

In addition to changing natural systems, a significant contributor to the rapid growth of wildfires has been the decimation of the U.S. Forest Service restoration budget that is the primary source of funding for restoration projects that reduce fire risks through removal of, for example, dead and small-diameter trees that act as tinder during wildfires. Unlike other natural disasters, such as hurricanes and tornadoes, communities suffering from catastrophic wildfires are not eligible for federal assistance from the Federal Emergency Management Agency. Instead, the costs of responding to wildfires are entirely born by the U.S. Forest Service and now devour more than half of all USFS resources, depriving the agency of critical resources for restoration and active management that would reduce ongoing fire risks. Annually, the Forest Service spends more than $1 billion to fight wildfires,[vii] and in 2015, one of the worst years for wildfires on record, the United States spent more than $2.6 billion[viii]—a record that we are poised to match this year.

After four years of unsuccessful efforts, Congress absolutely must first and foremost fix the broken system that funds our response to catastrophic wildfires. We strongly support efforts to fix the wildfire funding crisis, including the bipartisan "Wildfire Disaster Funding Act of 2017,"

led by Senators Crapo, Wyden, Feinstein, Risch, Cantwell, Hatch, Merkley, Gardener, and Bennet, and the House companion version sponsored by Idaho Congressman Mike Simpson.

Innovative Administrative Efforts

Even with scarce resources, federal land managers and local partners have not been standing idle. Through creative collaborations and management focused on restoration, Forest Service timber volume is up by 20% since 2008, and the U.S. Forest Service is restoring just under 5 million acres per year. The Collaborative Forest Landscape Restoration program, for example, has worked with partners to treat more than 1.45 million acres to reduce risk of fires. Additional collaborative efforts have also helped address:

- 84,570 acres to achieve healthier forests and watershed conditions
- 1.33 million acres for improved wildlife habitat
- 73,600 acres to address concerns for noxious weeds and invasive plants

Additionally, in the 2014 Farm Bill, policies such as the Good Neighbor Authority and Stewardship Contracting were codified and extended, supporting more improved forest management even within current budget constraints while providing significant benefits to communities and wildlife. While the U.S. Forest Service estimates that approximately 65-82 million acres of forest service land is in need of some type of restoration, we can look to these models for ways to address the myriad of issues facing our forests.

III. Bills Before the Committee

We support two of the bills before the Environment and Public Works Committee today that both have a targeted and specific approach simplifying common-sense administrative procedures and ensuring conservation priorities are the focus.

S. 1417 (Senators Hatch & Heinrich): Sage Grouse and Mule Deer Habitat Conservation and Restoration Act of 2017

Senators Hatch and Heinrich have done a commendable job working in a bipartisan fashion to craft the Sage Grouse and Mule Deer Habitat Conservation and Restoration Act of 2017. The loss of sagebrush habitat to threats including wildfire and juniper encroachment is a serious problem and affects hundreds of other species. We appreciate the Senators' singular focus on legitimate habitat restoration activities and addition of environmental safeguards such as excluding wilderness areas and the construction of permanent roads. These are exactly the sort of environmentally beneficial activities that warrant an improved and expedited environmental analysis.

We only have one concern to flag for the committee. The creation of temporary roads in sagebrush can be a vector for invasive species and can be hard to restore back into intact sagebrush. While we agree that the focus must be on reducing fire threats and removing juniper, every effort should also be made to ensure that there are no unintended ecological consequence of these actions. Despite this one concern, we strongly support the intent of this bill to get more

resources onto the ground to actively manage juniper and restore habitat, which can have an enormous positive impact on prime sage grouse and mule deer habitat.

Also worth noting is that the Departments of Interior and Agriculture already have the authority to create these expedited processes and this bill may be unnecessary if the Secretaries act administratively. The agencies may be better positioned to do a more thorough job in developing an exclusion from more extensive environmental review.

S. 605 (Senators Daines & Tester): Litigation Relief Act

We would also like to commend Senators Daines and Tester for their bipartisan and collaborative work on the Litigation Relief Act. S. 605 would better integrate two of the most important tools for managing wildlife and habitat on public lands—the Endangered Species Act (ESA) and federal land and resource management plans.

S. 605 is designed to:

- Ensure ESA consultation occurs on *plans* when they are created, amended, or revised.
- Rely on ESA consultation on *projects* to protect endangered and threatened species in between these significant plan decision points.

S. 605 would advance important forest management projects by reducing the threat of being unnecessarily blocked by lawsuits. While we, of course, agree that consultation to avoid management plan impacts on endangered species is important, we believe that the Forest Service can consider the impacts of the management plans during the standard processes to review them. Meanwhile, consultation under the ESA can still take place on specific activities under the plans when a plan is not being created, amended, or revised. This bill maintains the ESA as a conservation tool while maintaining the underlying processes for land management plans. The House version of this language is an example, however, of overreach where the consultation tools of the ESA are curtailed to an unnecessary degree on management plans.

There is some opposition to S. 605, however, within the environmental community, and this Committee could likely make a few minor modifications to the bill to mitigate some concerns. We offer our help to discuss those changes with other groups at the table.

S. 1731 (Senator Thune): Forest Management Improvement Act of 2017

While we share many of the same concerns about the health of our public forests, and commend a comprehensive approach, we respectfully cannot support S.1731 in its current form. Much like efforts in the House of Representatives, the Forest Management Improvement Act stretches too far beyond the scope of forest restoration and improved forest management. Simply put, it goes beyond the intent of minimizing mega-wildfires and improving wildlife habitat through restoration management. While we support many of the intended outcomes of the bill, we encourage the Committee to revisit the following provisions:

- Section 3(a-e): The creation of four new categorical exclusions, while in part aimed at wildlife habitat restoration, are extremely broad in scope beyond just habitat creation.

These new CEs increase harvest cuts to 10,000 acres, do not include environmental safeguards, and may produce unintended negative consequences. Projects this large and broad should contain processes that are transparent and at least include local collaboration. We believe that the similar outcomes for restoration and improved forest management could be achieved through an improved Environmental Assessment process to ensure there are not harmful unintended consequences.

- Section 3(f). The categorical exclusion codified in the 2014 Farm Bill was a good bipartisan deal, yet this section increases the size of a harvest by 7,000 acres and removes environmental safe guards, such as protecting old growth trees and the prerequisite of public collaboration.
- Section 4(a): This section reduces transparency and involvement of the public by limiting options under environmental review for all "forest management activities" to only two alternatives, regardless of whether the projects were developed through a collaborative process or not, or whether the projects focus on restoring forest health or another purpose.
- Sections 5 & 6: We are concerned about the undermining of strong healthy forest management tools codified in the 2014 Farm Bill by allowing permanent road creation under Good Neighbor Authority and lowering the value of services received by Stewardship Contracting.
- Section 7(e): This section limits public access to the courts with broad, potentially unlimited, arbitration for an undetermined amount of objections and appeals.

IV. Bipartisan Path Forward

In a year of near-record wildfires, we are optimistic that there is a pathway for a strong, bipartisan forest management and wildfire funding package of legislation to come together and earn 60+ votes before the end of the year. However, addressing devastating wildfires and restoring wildlife populations and habitat can only happen with bipartisan Congressional leadership. By focusing Congressional efforts on bipartisan measures that improve forest management with the objectives of mitigating fire risks, improving wildlife habitat, increasing carbon sinks, enhancing water supplies, and supporting rural jobs, we will ensure that both our National Forests and local communities benefit. Such a bipartisan package should include:

- *Fix the Wildfire Funding Crisis*: Congress must first and foremost solve the wildfire funding crisis and ensure adequate funding for both restoring forests and appropriately fighting wildfires. We encourage the Senate to take up immediately Senator Crapo and Wyden's "Wildfire Disaster Funding Act of 2017."

- *Improve Forest Management and Restoration:* Congress should advance bipartisan forest management proposals that will bolster and complement the wildfire funding fix with tools to provide improved forest management and restoration, such as:

    - *Promoting Landscape-scale Approaches:* Rather than focusing at the project level, the Forest Service should be encouraged to develop regional, landscape-scale plans that recognize the complex nature of the landscape, regional differences to forests and strives to protect, restore, and connect habitats on public and private lands, in terrestrial and aquatic environments, and in areas managed

primarily for conservation purposes as well as those where human uses predominate. We support legislative language, pioneered by The Nature Conservancy, which makes it clear the agency can conduct forest restoration projects across an entire landscape—and making it easier to implement the parts of projects that have minimal environmental impact on the ground.

- *Reducing Redundant Environmental Reviews for Restoration Activities*: If a landscape-scale analysis has been conducted for a specific area, then analyses of the environmental impacts of site-specific forest management projects need not reassess the same issues and can be much more efficient. Unnecessarily lengthy and overly burdensome processes for approving projects that produce ecological benefits strain the resources of the Forest Service.

- *Rewarding Collaboration*: When diverse citizens and groups collaborate on ways to manage forests for the common good they can come up with innovative projects that often deserve to be implemented. We support legislation to let forest projects proposed by collaborative groups be reviewed as is – without the Forest Service also coming up with and analyzing alternative proposals - as long as the collaborative group really is collaborative, and the project's environmental impacts are still analyzed.

- *Improving and Expanding Good Neighbor and Stewardship Contracting*: As mentioned before, both are relatively new and still under-utilized authorities which alleviate budget and environmental review challenges. Both can be expanded to conduct more restoration and improved forest management.

V. Conclusion

With near-record wildfires raging across the west, now is the time for bipartisan action to solve the wildfire funding crisis and improve forest management. Our federal land managers and local partners desperately need more resources and tools to confront the scale of the wildfire challenges we face. There are clear legislative solutions that both reduce the risks of mega-fires and enable more proactive restoration work that will benefit all of us. By solving the budget crisis and providing additional conservation tools, we can improve forest management to restore wildlife habitat, enhance downstream water quality and quantity, build our carbon sinks, expand recreational access, and provide more opportunities for the forest products industry and rural jobs. Only then, can we rest knowing that we have advanced President Theodore Roosevelt's "great central task of leaving this land even a better land for our descendants than it is for us."

---

[i] Westerling A. L. , et al. 2006.
[ii] Westerling A.L. 2017. Wildfires in West have gotten bigger, more frequent and longer since the 1980. The Conversation US, Inc. https://theconversation.com/wildfires-in-west-have-gotten-bigger-more-frequent-and-longer-since-the-1980s-42993
[iii] Westerling A.L., Hidalgo H.G., Cayan D.R, Swetnam T.W., 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity. Science: 313 (5789). http://science.sciencemag.org/content/313/5789/940
[iv] USDA 2015. https://www.fs.fed.us/sites/default/files/2015-Fire-Budget-Report.pdf
[v] Nijhuis M. 2012. Burnout. Nature Vol. 489, pp. 352–354 http://www.nature.com/news/forest-fires-burn-out-1.11424
[vi] New Mexico In Depth 2014. http://nmindepth.com/2014/08/30/new-mexicos-forests-are-warming-and-transforming/
[vii] National Interagency Fire Center 2016. www.nifc.gov/fireInfo/fireInfo_documents/SuppCosts.pdf.
[viii] E&E News 2016. https://www.eenews.net/greenwire/stories/1060030747

Senate Committee on Environment & Public Works
Hearing entitled *"Hearing on Forest Management to Mitigate Wildfires: Legislative Solutions"*
September 27, 2017
Questions for the Record for Mr. Collin O'Mara

Chairman Barrasso:

1. Mr. O'Mara, you expressed support for a number of provisions in Senator Thune's S.1731, highlighting both the need for collaborative efforts on federal forests, as well as the need to achieve management/restoration objectives quickly. Additionally, you highlighted frustrations that collaborative efforts have been derailed in the final stages by individuals not part of the process. Combining these three principles, would you support provisions that would streamline decision-making and provide certainty for collaborative processes, while allowing forest work to proceed in an expedited manner?

Response:

The National Wildlife Federation supports improved decision-making processes for forest restoration projects recommended by balanced collaborative groups. We believe that one significant way to provide certainty for collaborative processes is to focus the alternatives analyzed under the National Environmental Policy Act on those proposed by the collaborative, a no action alternative, and the possibility of another alternative if it can advance local forest management objectives and the project itself. The approach put forward by S. 1731 can expedite decision-making but it does not provide certainty to collaboratives that their project will be approved. It does, however, provide legitimate and balanced collaborative groups a reasonable level of certainty that their proposed project will be seriously considered and evaluated. We think that is important to fostering collaborative forest restoration efforts and implementing forest management projects on the ground. Adequate funding, however, is the linchpin and is still needed for an agency to carry-out strong collaborative processes or any environmental review.

2. Mr. O'Mara, active management comes in many forms. For example, removal of trees from a forest can be as part of a timber harvest, salvage timber operation, habitat improvement objective, or hazardous fuels reduction project. Each of these provides a specific benefit to the ecosystem, but there are additional associated benefits like recreation access and improved watershed health. Do you believe that ecosystem restoration projects that target multiple needs of a forest (watershed health, wildlife habitat, species diversity) would benefit overall forest health?

Response:

Simply put, activities that manage forest for the purpose of reducing the risk of megafires can also have multiple ecological benefits when designed well based upon site-specific analysis. As we wrote in our recent report, "Megafires"(https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/NWF-Report_Megafires_FINAL_LOW-RES_101717.ashx), while addressing the restoration deficit of 65-82 million acres is vital for a variety of benefits such as megafire suppression, habitat improvement, water quality and carbon intake, there is no one size fits all approach for forest restoration. Forest restoration and

hazardous fuels reduction must be firmly grounded in the dynamics of a particular forest. Salvage logging, for example, if done well in appropriate areas, can reduce the risk of fire; however, in other locations it's been shown to increase the risk as well as potentially cause other ecological impairments.

Multi-purpose ecosystem projects do not automatically create all of these benefits, but we can encourage outcome-driven collaborative processes that have the explicit, multiple goals of improving forest health, reducing fire risks, increasing wildlife populations, and improving water quality. One example of how smart forest restoration can have multiple benefits is the Collaborative Forest Landscape Restoration Program that works with local partners and has reduced wildlife risk on more than 1.45 million acres along with improving 1.3 million acres of wildlife habitat. By addressing multiple needs of the forest through both the development of multi-objective forest plan, as well as the design of individual projects, we can maximize the public benefits. This is why the National Wildlife Federation strongly supports collaborative forest planning and an appropriate level of environmental analysis.

Ranking Member Carper:

3. Throughout the course of our hearing, you all mentioned that you would like to see expanded use of the Collaborative Forest Landscape Restoration Program. What can Congress, federal agencies and/or industries do to help bolster national forest collaboratives?

Response:

Congress should prioritize fixing wildfire funding first and foremost. This will provide the Forest Service the funding it needs to manage all the national forests for the full range of multiple uses. The Forest Service will then have the financial and staff capacity to better implement effective programs like the Collaborative Forest Landscape Restoration Program (CFLRP) and support and respond to local National Forest collaboratives.

More specifically, we support offering collaboratives that meet criteria for balance, openness, and collaborative management guidelines the benefit of having their projects considered as proposed, as discussed above, through analysis under NEPA of only the proposed action, no action, and a possible third alternative.

4. In your oral testimony, you mentioned that wildfires are becoming more intense and more frequent. You also suggested that we cannot ignore the contribution of climate change to fire intensity and frequency and that there are actions we can take to address it. You stated your support for the Litigation Relief for Forest Management Projects Act and the Sage-Grouse and Mule Deer Habitat Conservation and Restoration Act. Would you elaborate on any additional actions you believe could directly address the impact of climate change on our forest lands?

Response:

Climate change is fueling unprecedented megafires in U.S. forest lands. The U.S. must address the growing threat of megafires through a comprehensive wildfire funding fix, through

dramatically scaling up the pace of forest restoration, through incorporating climate adaptation practices into forest restoration and management, through providing better data and climate modeling to help improve local land use decisions in the wildland-urban interface, and through achieving significant reductions in climate-altering carbon pollution. By restoring and better managing U.S. forests, it is possible to reduce fire risks to communities, increase populations of cherished wildlife species, and protect our climate by enhancing the carbon sequestration and storage potential of our forests. These steps will help ensure that America's forests will be sustainable and resilient in the face of a rapidly changing and uncertain future, and will be capable of continuing to provide important economic, ecological, and societal benefits.

For additional recommendations, please see the National Wildlife Federation's aforementioned report, "*Megafires: The Growing Risk to America's Forests, Communities, and Wildlife*."

5. In your written testimony, you stated that "Congress absolutely must first and foremost fix the broken system that funds our response to catastrophic wildfires." In your oral testimony, you stated that we should link management improvements to the funding crisis. Do you believe management reforms should only be considered in the context of a long-term funding solution – in other words, that reforms will not make a meaningful difference without a funding solution? Do you believe that, if a funding solution is reached, any management reforms should be narrowly tailored and able to garner broad bipartisan support?

Response:

Fixing how wildfires are funded is the most important thing Congress can do to improve federal forest management and increase the scale and pace of forest restoration. A forest fire funding fix will have tremendous benefits for forest management by providing the Forest Service the resources it desperately needs to manage the national forests, implement forest plans, and take advantage of its many existing forest management tools. We support the approach of the "Wildfire Disaster Funding Act of 2017."

However, the land management agencies need not only money but also improved policy tools to modernize forest management and restore more forests more rapidly, in order to respond to today's unprecedented forest management challenges – climate change, extreme drought, subsequent insect and disease outbreaks, a growing population and greatly expanded housing development adjacent to national forests. We believe it is practically and politically important to simultaneously improve and expand the restoration tools at the land management agencies' disposal such as the continued promotion and development of Good Neighbor Authortiy and Stewardship Contracting. We support tailoring those forest policy changes as narrowly as necessary to fulfill their purpose and garner bipartisan support and become law. For example, a wide range of forest management projects may benefit various wildlife species, but policy changes with a stated goal of facilitating the restoration of wildlife habitat should be reserved for projects specifically designed to restore wildlife habitat. A similar approach should be toward other forest management goals such as hazardous fuels reduction. We do believe bipartisan forest management legislation, with a focus on collaboration and restoration, can be designed and passed by this year.

6. In your testimony, you suggested a collaborative process to discuss concerns regarding the Litigation Relief for Forest Management Projects Act and the Sage-Grouse and Mule Deer Habitat Conservation and Restoration Act. First, thank you for that suggestion. I appreciate your interest in building a broad, diverse base of stakeholder and member support. Would you commit to me that the National Wildlife Federation will participate in this process with concerned stakeholders, the bill sponsors, and members of our Committee to resolve as many concerns as possible?

Response:

The National Wildlife Federation would be happy to participate in a process to see broader support for these two bills, and to resolve concerns about them, and to work with stakeholders, bill sponsors, and members of the Committee in this effort.

7. While speaking about the Forest Litigation Relief for Forest Management Projects Act, you mentioned that forest plans are supposed to be updated every 10 years, but it ends up being more like 25 years in practice, which delays projects that could help species today. Do you believe the delay in updating forest plans is in large part due to lack of agency funding?

Response:

The delay in updating forest plans is largely due to a combination of lack of funding and competing agency priorities. Forest planning is vital to the responsible management of the public's forests, as planning is vital to the function of any organization. Planning is not without cost, but the costs of planning are offset by improved efficiency in forest management. Done right, the investment in the crafting and analysis of forest plans pays off in faster and more effective analysis and implementation of individual projects, as project analyses tier off the overarching plan analysis. Congress should recognize the importance of forest planning, particularly the opportunity it provides for local stakeholders to have a say in how their forests are managed, and to adequately fund forest planning.

National Forest managers also need to fully recognize the importance of planning to their operations and to prioritize revising forest plans. The Forest Service too often focuses on project implementation to the exclusion of planning, contributing to massive delays in revising forest plans and in less strategic and less efficient projects. Appeals and litigation play a role in forest plan delays but funding and prioritization are the fundamental issues.

8. You mentioned that you agree with Senator Thune on the need to address a lot of the concerns he raised during his statement to our Committee. In your written testimony, you also stated that the National Wildlife Federation "cannot support S. 1731 in its current form. Simply put, it goes beyond the intent of minimizing mega-wildfires and improving wildlife habitat through restoration management." Would you elaborate on the elements of the legislation that case you the most concern?

Response:

We do not consider more categorical exclusions (CEs) to be a primary solution to the forest restoration backlog. The Forest Service already has numerous CEs at its disposal and they cover a wide range of forest management activities. A targeted expansion of a CE focused on the restoration of forest health and resilience could contribute to increasing the pace and scale of forest restoration. However, we feel that S. 1731 includes too many CEs, and that they are too large, at 10,000 acres or larger, to ensure insignificant environmental impact, and are overly broad without environmental safeguards such as those that exist with the last codified CE in the 2014 Farm Bill.

Further, the limitations on NEPA particularly alternatives analysis are too broad, and not narrowly tailored to collaborative forest restoration projects. Limitations on NEPA environmental analysis should, in our view, be narrowly tailored to situation where an expedited or more narrow review of alternatives is warranted, such as in the case of a robust collaborative forest proposal.

We also believe that the judicial review incentives of the Healthy Forests Restoration Act are expanded to too many projects–they would be able to apply to practically all vegetation management projects.

9. You highlighted the dire need to develop a more sustainable funding solution for firefighting. This problem expands beyond the Forest Service though. We still do not know the full extent of the damages from Hurricanes Harvey, Irma and Maria. Year after year, we are forced to react to increasingly more dangerous storms, and I believe we need to take a proactive approach to preparing and protecting our communities. Would you share with the Committee some of the National Wildlife Federation's ideas to build more resilient communities – whether they border forests, rivers or oceans?

Response:

Much of the damage that we are experiencing across our nation is a direct result of decades of underinvestment in the restoration of natural systems and hazard mitigation, as well as the continuation of policy incentives that encourage individuals to live in harm's way, whether that be along the coast, flood-prone riparian corridors, or the wildland-urban interface.

In our *Megafires* report we recommend increasing the adoption of practices to prepare for the worsening impacts of more frequent and intense fires, including the following:

- Increasing the pace of forest restoration projects that improve natural resource outcomes and reduce fire threats;
- Assisting states/municipalities to plan for the future impacts of climate change;
- Focused development in areas of low fire risk;
- Require fire resistant building materials;
- Prioritize fire prevention resources in the wildland-urban interface where they will have the greatest positive impact on reducing the consequences and costs of wildfires.

Beyond forests, as climate change exacerbates and makes natural disasters more frequent and more severe, the National Wildlife Federation is a leading advocate for reform of the National Flood Insurance Program and the Stafford Act, as well as increased funding for proactive mitigation measures and bolstering of natural defenses through the Army Corps, FEMA, EPA (SRFs), HUD (CDBG), DOT, and other programs. We believe that government should remove perverse incentives to developing in risky areas and instead invest in preventative measures, such as restoring wetlands, dune systems, and living shorelines that protect local communities while providing wildlife habitat.

In the new normal of accelerating climate impacts, whether floods or fires, respecting nature and giving it proper room is key. In coastal and riverine communities, we recommend maintaining the naturally functioning floodplain whenever possible, because the natural systems, like wetlands, can absorb large volumes of water (300,000-1M gallons/acre) and slow the velocity of floodwaters or storm surge. By restoring natural defenses and reducing the number of structures in harm's way, we can save lives and avoid billions of dollars of damage. With regard to forest-fires, we recommend both improving forest restoration practices and decreasing development across the wildland-urban interface to again allow for an appropriate protective buffer between forests and development. In the built environment, we encourage designing buildings to withstand the event through methods like improved building codes, roof latching, flame-resistant materials, elevated or reinforced structures, etc.

Most importantly, the National Wildlife Federation believes that "an ounce of prevention is worth a pound of cure" and strongly encourages proactive investments in restoring natural systems and making communities more resilient, all of which will alleviate the potential suffering of millions of Americans, while dramatically reducing the costs for taxpayers.

10. Our hearing focused on wildfires in the West, but wildfires are a national threat. Would you provide the Committee with your perspective on wildfire risks and habitat impacts in other parts of the country?

Response:

National forests outside of the western United States are affected by forest fires in two primary ways:

1. Direct impact of forest fires, which occur throughout the National Forest System, especially in the southeast; and
2. Loss of funding to manage and restore forests throughout the rest of country, because restoration accounts are raided to pay for fire suppression in western states.

The 2016 forest fires in Tennessee that took 14 lives and injured 134 people brought national attention to the threat of wildfires in the eastern U.S. Higher densities of people and communities within and near national, state, and private forests in the east create the potential for significant human and economic impacts from eastern wildfires. Carefully crafted forest plans are as important to good forest management in the east as in the west, and implementation of those forest plans is also critical because it is through plan implementation that forests are managed. Forest plan implementation requires funding, and eastern national forests lose core funding to fire borrowing to fight forest fires through the country. Improving how forest fires are funded

will resolve this recurring problem and allow the Forest Service to undertake forest management that will improve the resilience of eastern national forests to fire and other threats.

Senator Whitehouse:

11. A recent study in *Nature Communications* showed that wildfire seasons in the American West have increased by nearly one day per year between 1979 and 2013 (Jolly et al., 2015). Furthermore, the six worst fire seasons since 1960 have all occurred since 2000 (USDA Forest Service). Since 2000, many western states have experienced the largest wildfires in their state's history (USDA Forest Service). Just this year, an outbreak of lightning early in June started multiple fires in southwestern Alaska that have collectively burned over 68,000 acres. In early March, high winds quickly spread wildfires across parts of Kansas, Oklahoma, and Texas. One of the fires burned over 800 square miles of Clark and Comanche Counties in southern Kansas, killing six people and thousands of cattle. Thousands of miles of fences were burned too, which may cost $10,000 per mile to replace. This fire became the largest single wildfire in Kansas' history, a record that was set just a year ago by the Anderson Creek fire (NOAA National Centers for Environmental Information).

a) How is climate change shaping the length of wildfire seasons and extent of burned forest?
b) How is climate change changing what states, regions, or local areas are more or less prone to wildfire?

Response:

As we point out in our *Megafires* report, although there are multiple reasons for the overall increase in wildfire activity, researchers have concluded that over the past few decades climate change has caused more than half the increase in fuel aridity, and is responsible for a doubling in the cumulative forest area burned.[1] Climate change increases the risk of more frequent and severe fire in several ways. Earlier spring snowmelt, higher temperatures in spring, summer, and fall, and increases in evapotranspiration, all contribute to drying of vegetation, and extend the geographic area and time periods in which forests become combustible.[2] These changing climatic conditions have resulted in wildfire seasons becoming longer, particularly in the western United States. The U.S. Forest Service has concluded that fire seasons are now on average 78 days longer than in 1970.[3] The area of forest burned annually in the Pacific Northwest has increased by nearly 5,000 percent since the early 1970s, while the area burned in the Southwest has increased by nearly 1,200 percent.[4,5]

Higher temperatures and extreme drought can trigger tree stress and mortality, which can increase fire risk. In California, for instance, more than 100 million trees died during the recent prolonged drought, called unprecedented in modern history.[6] Drought-induced stress can exacerbate outbreaks of forest pests, such as bark beetles, which can also increase the susceptibility of forests to wildfire.[7] Mountain pine beetle infestations in particular have caused significant tree mortality across millions of acres in the Rocky Mountains.[8] Various species of bark beetles are also causing significant forest damage elsewhere in the U.S., including Alaska and the Southeast, and appear to be expanding their range due to warming conditions. Southern bark beetles, for instance, historically have been restricted to pitch pine forests of the South, constrained by cold winters further north. That has now changed, and since 2002 the beetles have

damaged more than 30,000 acres of forest in New Jersey, and recently have been detected in forests as far north as Massachusetts.[9]

Wildfires are also becoming a bigger problem for more types of southeastern forests as well. Periodic drought conditions associated with a changing climate are contributing to much larger, more intense wildfires that can affect not just drier pinelands, but burn typically moist hardwood forests as well.[10]

12. While healthy forest ecosystems are increasingly important to limit the worst consequences of climate change by removing carbon dioxide naturally from the atmosphere, scientists are seeing signs that fire and climate change are combining to create a 'new normal' for the nation's forests (Balch et al., 2016). For example, wildfires burned over 10.1 million acres across the U.S. between June and November of 2015, surpassing 2006 for the highest annual total of U.S. acreage burned since record-keeping began in 1960. The most extensive wildfires occurred in Alaska where over 5 million acres burned within the state. There was extensive burnt acreage across other western states, including North Dakota and Wyoming. Total damage exceeded $3 billion dollars. How do these trends relate to wildfire frequency and severity?

Response:

The eight worst wildfire seasons on record have all occurred in the past 15 years. The frequency, size, duration, and intensity of wildfires are steadily increasing at an alarming rate with average acreage burned increasing from 3.7M/year in 1967-1977 to 6.5M/year over the past decade (we are over 8.8M for 2017, a year that started with good snowpack). Please see our *Megafires* report for additional background.

Thank you for the opportunity to provide more input to the Committee on this important issue.

---

[1] Abatzogloua, J.T. and A.P. Williams. 2016. Impact of anthropogenic climate change on wildfire across western US forests. Proceedings of the National Academy of Sciences: 113: 11770–11775.
[2] Westerling, A.L. 2017. Increasing western U.S. forest wildfire activity: sensitivity to changes in the timing of spring. Philosophical Transactions of the Royal Society B 371: 20150178.
[3] U.S. Forest Service. 2015. The Rising Cost of Wildfire Operations: Effects on the Forest Service's Non-Fire Work. Washington, DC: U.S. Forest Service, Department of Agriculture. https://www.fs.fed.us/sites/default/files/2015-Fire-Budget-Report.pdf.
[4] Westerling, A.L. 2017. Wildfires in West have gotten bigger, more frequent and longer since the 1980. The Conversation, May 23, 2016. https://theconversation.com/wildfires-in-west-have-gotten-bigger-more-frequent-and-longer-since-the-1980s-42993
[5] Westerling A.L., H.G. Hidalgo D.R. Cayan and T.W. Swetnam. 2006. Warming and earlier spring increase western U.S. forest wildfire activity. Science 313: 940-943.
[6] Stevens, Matt. 2016. 102 million dead California trees 'unprecedented in our modern history,' officials say. LA Times, November 18, 2016. http://www.latimes.com/local/lanow/la-me-dead-trees-20161118-story.html
[7] Joyce, L., et al. 2014. Forests. p. 175-194. In: J.M. Melillo, T.C. Richmond, and G.H. Yohe, eds. Climate Change Impacts in the United States: The Third National Climate Assessment, U.S. Global Change Research Program. Washington DC: Government Printing Office.

[8] Bentz, B.J., J. Régnière, C.J Fettig, E.M. Hansen, J.L. Hayes, J.A. Hicke, R.G. Kelsey, J.F. Negrón and S.J. Seybold. 2010. Climate change and bark beetles of the western United States and Canada: direct and indirect effects. BioScience 60: 602-613.
[9] Schlossberg, T. 2016. Warmer winter brings forest-threatening beetles north. New York Times, March 18, 2016. https://www.nytimes.com/2016/03/22/science/southern-pine-beetles-new-england-forests.html?_r=0
[10] Gilpin, Lyndsey. 2016. The Southeast is Becoming a Wildfire Hotspot. FiveThirtyEight, December 8, 2016. https://fivethirtyeight.com/features/the-southeast-is-becoming-a-wildfire-hotspot/

Senator BARRASSO. Thank you very much for your testimony. I appreciate the testimony of all of you. We will proceed to some questioning at this time, and I will start with Ms. Crowder.

According to the Federal land management agencies, on average, humans are, either intentionally or unintentionally, responsible for many of the wildfires in the United States. Casper Star Tribune reported that the cost of fighting the most expensive fire in United States history was in California, and that exceeded $200 million. The fire was caused by an illegal campfire. Last year, in Wyoming, a fire believed by the authorities to be man-caused destroyed a residential home and burned more than 19 square miles near Yellowstone National Park. It cost the U.S. Bureau of Land Management $1.4 million to fight that fire in Wyoming.

Given the high cost to the American taxpayer, are there measures that we should be taking in order to make our forests more resistant to catastrophic manmade fires, or man-caused fires?

Ms. CROWDER. Mr. Chairman, yes, there are steps we should be taking and could take fairly easily. First, continued support for State fire assistance programs is important. In Wyoming, this includes fire prevention efforts such as education, educating the public on the impacts that their actions may have on citizens and even just their visit to these areas. Fire-wise programs to help homeowners and communities reduce the risk of wildfire damage are also important. Of course, hazardous fuel reduction projects are very important. This is an opportunity to mitigate wildfire hazards and lessen the threat of catastrophic fires or megafires. It is an opportunity to reduce lighter fuels, opportunities to reduce surface fuels, and also put in place some thinning projects.

And these State fire assistance programs also provide the State opportunity to build or maintain capacity of State, Federal, and even volunteer fire departments, which become important in initial attacks when we have these fires. And, of course, I believe also that proactive management on a large scale is necessary as well.

Senator BARRASSO. Following up on that, to Mr. Fite, some parties are advocating a complete hands-off approach to national forests. In the past, you have expressed some skepticism over this concept of passive forest management. Specifically, June of this year you were quoted in Courthouse News as saying this approach "leads to conditions that are quite unhealthy and even dangerous."

So, do you feel that there is a way to have healthy interactions with forest ecosystems and make forests more resilient to disease, to pests, and to catastrophic fire?

Mr. FITE. Yes, Mr. Chairman, absolutely. There are things that we can do to make our forests more resilient and to restore a more natural role of fire in our ecosystem, and that involves active management, that involves untying our land and management agencies' hands so they can implement active management on a wider basis and without devoting so much of their resources to planning activities. For example, the Forest Service figures that we have seen 40 percent of their time and resources are spent on paperwork and planning, and that is not the way we should be out there managing our forests, reducing the fuels so that, when a fire comes through, the impacts are not catastrophic like we have seen this year.

Senator BARRASSO. Thank you.

Ms. Crowder, you know, as a doctor, I am concerned about health impacts of these wildfires. Earlier this month, the Casper Star Tribune reported that the EPA considered the air quality over parts of several western States as very unhealthy because of the fires. It also quoted a physician with the American Lung Association who warned that fires spew particulates into the air which are linked to premature death and cancer, and can make asthma and chronic lung diseases worse.

As a Wyoming official and a resident, can you describe what impacts these fires are having on the physical health of the people of the West?

Ms. CROWDER. Yes, Mr. Chairman. Human health is certainly a concern when it comes to wildfires. The air quality in Wyoming has been particularly bad this summer. Particulate matter, or those particulates that are suspended in the air, really do cause damage. The Wyoming Department of Health has put out several announcements and warnings to Wyoming citizens over the past several months, warning them to stay indoors and close their windows. You know, as a Wyoming resident, I have seen my own neighbors be forced inside because of air quality, and that is concerning in Wyoming.

Additionally, we are concerned about visitors who visit our great State, and the impacts that poor air quality has on them and their trip, as well as our economy.

We are also concerned with municipal watersheds and the impacts that fires may have on municipal watersheds, from sedimentation to notices from the Cheyenne Board of Public Utilities that our water may smell like smoke or taste like dirt because of a small wildfire in the area.

So these are real health concerns in Wyoming.

Senator BARRASSO. Thank you.

Senator CARPER.

Senator CARPER. First of all, welcome one and all, colleagues. It is great to see you back here, and thank you for all the good work that you continue to do with your life; and I think the same is true for our other witnesses as well.

You had a chance to hear Mr. O'Mara's comments in his testimony. Do you agree, Ms. Crowder, with anything he said?

Ms. CROWDER. Mr. Chairman, Senator Carper, he makes some very good points. Fire is a natural process and we do need to look at management at a large scale, and management needs to occur now at a large scale. There are several tools that we have in the toolbox, and we need to be using those immediately.

I also believe that the testimony that Mr. O'Mara put forward that these megafires are of concern is absolutely true, and I do believe that collaboration is an important part of the process. We have seen some collaborative processes in Wyoming move forward. We have seen the Forest Service lead some of these collaboratives in Wyoming and put together landscape scale, and start to put landscape scale management activities, and that is important.

However, I do think we also need to move quickly, and time is of the essence here. Thank you.

Senator CARPER. All right. Thank you.

Mr. Fite, do you agree with anything that Mr. O'Mara had to say here in his testimony?

Mr. FITE. Yes, Senator. For example, Mr. O'Mara discussed the Cottonwood bill, S. 605, sponsored by Senators Daines and Tester, and how that is a way to ensure that we get needed forest management projects done particularly in the northern Rockies and other regions where they are being held up for paperwork reasons that aren't producing conservation benefits.

On the collaboration aspect, we in the industry support collaborative efforts where they produce good projects. We have a project where I, in fact, represented a collaborative in court that has been held up in litigation under the Cottonwood decision. So that is holding up collaborative projects, and that is why we need that fix.

Senator CARPER. All right, thank you.

Collin, in your testimony, I think regarding the Litigation Relief Act, you mentioned that other members of the conservation community who are concerned that this bill, this would be the Tester-Daines bill, are concerned that this bill may be broader than necessary to achieve its goals and may result in some unintended consequences.

Could you just elaborate on these unintended consequences and how we might address these concerns in the legislation?

Mr. O'Mara. Sure. Thanks, Senator. And I have to give Senator Daines and Senator Tester a lot of credit. If you compare this bill to the House bill, it is already much more concise, and I think there is some concern that if you are only looking at the project level, when there is new information that comes on, that there could be information that should be integrated into kind of cumulative facts across the entire plan. I, frankly, think with a little bit more conversation we can actually resolve this quickly. We support the bill as it is. We are very grateful to Senator Daines for the work that he has done. We think that is actually a very strategic approach. These plans are supposed to be done every 10 years. It is more like 25 years in practice. So we just don't want to see projects held up that are going to help species today waiting for some long, collaborative process. But I think the biggest thing is just making sure there is no unintended consequences at scale.

Senator CARPER. Our other witness, do you have any brief reaction to what Collin just said? Briefly.

Ms. CROWDER. Mr. Chairman, Senator Carper, yes, I do believe that these projects do need to happen for habitat management and other reasons as well. As I spoke about earlier, the bill, the Daines-Tester bill does allow for project-specific consultation, and that is important. Ultimately, we want to see species recovery, and we don't want to harm that in any way or harm the opportunity for actually getting management done on the ground. So I do agree that is an important step forward.

Senator CARPER. OK, thanks.

Mr. Fite, any comment on what Collin just said?

Mr. FITE. Yes, thank you, Senator. I think this bill is very carefully drawn. It does not undo existing law as to how you consult when you revise or prepare a new forest plan. So Senators Daines and Tester worked very carefully to make this a narrow fix that

just eliminates work that is not going to actually benefit our species.

Senator CARPER. All right. I have some more questions and hope we will have an opportunity to ask those. Thanks for those responses.

Senator BARRASSO. You certainly will, Senator Carper.

Senator INHOFE.

Senator INHOFE. Thank you, Mr. Chairman. I have been sitting and listening with a lot of interest. Of course, I know this hearing is covering the forest fires, but we have prairie fires in Oklahoma. In fact, the last one we had was not really a record-setter, but it is something that we are facing. I can remember flying my own plane over it and going all the way up to southern Kansas and seeing the carcasses of animals up against fences where they were trying to get loose. So it is a very tragic thing.

Ms. Crowder, in your testimony you say outreach at the early stages of development in the NEPA process would be key to reducing the time it takes to reach a decision. We have a lot of experience in that in this Committee during our highway bills and everything else, and we have learned from experience that we can do that. Last week I introduced a bill that pertains to the FERC permitting, providing for all Federal, State, and local regulatory agencies to come to the table early to coordinate their participation. It sounds to me like this is needed across government for all other types of projects.

Can you further detail as to why it is important to get all the stakeholders at the table early, rather than later?

Ms. CROWDER. Yes, Mr. Chairman, Senator Inhofe. I have extensive experience working on these National Environmental Policy Act processes and actually putting the documents together, and, from my personal experience, those projects where the Federal agencies engage State and local governments, as well as others, early in the process tend to move a lot faster. So, for example, if a State agency has, and they often do, wildlife data that is important and useful for the Federal agency, then that State agency can bring that wildlife data forward, instead of waiting until the last minute to provide that information.

Senator INHOFE. Which is normally the case.

Ms. CROWDER. Often the case, yes, sir. So I believe that bringing the entities to the table that have the data and expertise is of most importance.

Senator INHOFE. And I think we successfully did this in some of our, in our FAST Act, the previous transportation bill prior to that, and we got some things done that otherwise we would not have gotten done. It was a joint effort, very bipartisan effort and very successful.

Mr. Fite, in hearing your testimony today, there seems to have been more of a system for forest practices at a more local level. Besides the NEPA process, the Forest Service and other agencies are constantly blocked from responsible forest management through litigation from environmental groups that challenge every decision, even when these decisions are backed by science and beneficial to the overall ecosystem. There is a problem that needs to be solved, as these cases delay projects for years and create uncertainty, and

then we will see situations like when the circuit courts split and the Supreme Court doesn't weigh in.

What are your thoughts? You concentrated in your opening remarks more about S. 605, but on the other bill that Senator Thune was interested in, S. 1731, do you have any other thoughts on how you can solve these problems? Concentrate more on 1731.

Mr. FITE. Yes, Senator. Thank you for the question. Litigation is a real problem, particularly when you have a project like you were describing, where stakeholders get involved, they are at the table helping develop the project, and then an outside group comes in at the very end and undoes the whole process, halts everything in litigation. And the arbitration provisions in 1731 I think are a good step at a pilot project for trying to figure out ways to streamline the litigation process, because right now the litigation process on top of the planning process can take years and years, and we need to fix that.

Senator INHOFE. Well, that is good. Do you think 1736 would help in that respect?

Mr. FITE. Yes, Senator.

Senator INHOFE. The legislation we are discussing today are some ways to address forest management issues. Are there other things that Congress could do that are not addressed in this legislation? Anybody?

Mr. O'Mara. Senator, thank you. I would really——

Senator INHOFE. You are a very effective fast talker. My wife is always telling me to talk slower, and I am realizing now there is a great benefit to talking faster.

Mr. O'Mara. Trying to squeeze 10 minutes into 5 minutes.

[Laughter.]

Mr. O'Mara. I joke that I grew up in Syracuse, New York; and if you don't talk fast, your mouth actually freezes shut.

I would encourage everyone to take a look at Senator Crapo's legislation on the funding side, because if we fix the funding side and there are sufficient resources for managers and we make some of these management improvements so they have more tools, then we actually could have a victory that would transform forest management in this Country; and, frankly, it would be one of the most significant improvements in decades. So putting those two together I think could be an absolute homerun.

Senator INHOFE. Good. Appreciate that.

Any other comments on that, other things that could be done?

Mr. FITE. There are a number of measures that have been proposed on the House side in a bill sponsored by Congressman Westerman that can really streamline planning processes, in particular an action-no action analysis. So that could really streamline——

Senator INHOFE. Well, that is interesting. We will get that and look at those provisions.

Thank you, Mr. Chairman. By the way, this is just another reminder that we have a problem between two Committees, this Committee and the Commerce Committee, that always seem to meet at the same time, so one of these days we will get that fixed.

Senator BARRASSO. Thank you, Senator Inhofe.

Senator MERKLEY.

Senator MERKLEY. Thank you, Mr. Chairman.

And thank you all for your presentations.

Oregon has been burning with 20 major forest fires, and some of those are complexes, meaning it is called one fire, but it is actually maybe a dozen. At one point there were over 80 fires burning in my State just recently.

Mr. Fite, I was up on the Eagle Creek Trail and the Pacific Crest Trail while the Indian Springs was burning on Eagle Creek, but we then had the fireworks that set off the whole Pacific Gorge aflame, and phenomenal just what that did.

Oregon has had probably more success than any State in the Country on stewardship projects and collaboratives, and that effort came from, well, we have this war, this war going on over our forests, with some saying, hey, they should be managed primarily to get forests to an old growth State where they are fire resistant, and don't mess with Mother Nature, and others saying the solution to everything is to clear-cut. So that war was unproductive, ends up in all these court battles, so out of that came the stewardship efforts and the collaborative efforts.

We have hundreds of thousands of acres in Oregon of second growth forests that are really good for fire and they are really good for disease, but they are not either great for either timber stands or for ecosystems. So there is a potential here for a win-win, and that is what the stewardship projects and the collaboratives are all about. And essentially, in the end, it is some version of thinning. You have these forests with the trees far too close together. The boughs are very low; the fire easily moves from the soil level to the canopy. Every tree is so close it lights the next one on fire; any wind blows through that. Then that carries over out of the fatal forests onto private land.

So I was involved in a couple pilot projects that involved various types of thinning, and I have been up in the woods with both timber companies and the environmental groups to discuss how do we push this forward. So I just wanted to ask each of you, Ms. Crowder, do you feel like there is a real space for thinning projects to be able to kind of provide a steady supply of saw logs to the mills, but also to reduce the disease and fire challenges that we have in these forests?

Ms. CROWDER. Thank you, Mr. Chairman, Senator Merkley. Thinning is absolutely a useful tool for reducing fuels. It reduces fuels that lead to crown fires potentially; it has the potential to improve wildlife habitat; has positive impacts on tree growth, which leads to positive tree and forest health. It also leads to a potential decrease in insect and disease. So I do believe that thinning is a useful tool for reducing fuels and improving forest health. But thinning is only one of the tools in the toolbox.

Senator MERKLEY. I am going to run out of time, so I won't ask you to go through the other tools.

Mr. Fite, do you feel that is a useful tool?

Mr. FITE. Yes, Senator. Thinning projects are a useful tool. I would say that even for thinning projects the process and litigation has become a significant roadblock. For example, projects in Oregon, a 187-acre project, for example, or a couple thousand acres, courts have required an environmental impact statement which is

on the level of—that is more documentation than you need to build a new runway at Hillsboro Airport, quite literally, and that is why we need some fixes to management.

Senator MERKLEY. Thank you, Mr. Fite. I will point out that virtually no stewardship projects ended up in court in Oregon. The whole point is to get people together beforehand and work out what is referred to as a prescription so you don't battle it out in court and you actually get work done in the woods.

Mr. O'Mara.

Mr. O'Mara. Thank you, Senator. I think you are right, I think some of the collaboratives in Oregon are some of the best examples, and I think some of the early stewardship contracting. I would like to see a lot more of it. I want to make sure that we actually enhance those programs and kind of build on the lessons since the Farm Bill. But, absolutely, thinning, prescribed burns, the things that actually work for some of the northwestern forests are absolutely essential to improve management.

Senator MERKLEY. One of the challenges with thinning projects is they are often not commercially viable. It is just a lot, if you will, cheaper to take out trees in big chunks, big clear-cuts, and that is why we have programs to help fund that thinning. We had a lot in the stimulus bill. We have various other fuel hazardous loads and so forth programs. But we need to do a lot more of that.

That is an interesting sound. Whose phone was that?

Unidentified Speaker. Seems like it was coming from out there. [Laughter.]

Senator MERKLEY. Hello.

So that is one challenge, the funding to do those thinning projects.

But one of the things that happens often when we have fires is there are folks who say, well, you know, the best thing to do is just get rid of the environmental side and let's go in and allow clear-cuts without any sort of action and, by the way, let's take out the fire-resistant trees at the same time, which just puts off alarm bells. Why would we take out old growth and the fire-resistant trees in the course of trying to make a forest more resilient?

And since I am out of time, I won't ask you all to answer that, but I did notice that is exactly what is in Senate Bill 1731, full permission to take out the old growth and the fire-resistant trees; and that is just the sort of approach that destroys all the efforts to bring together the two communities to create forest health, because it is like, oh, well, here is an excuse to just go to old-style clear-cutting, rather than actual forest stewardship and making the better timber stands and better ecosystems.

So I just wanted to express that concern and say that we really need to focus on not increasing the timber wars, but expanding on the foundation we have from the stewardship contracts and the collaboratives who are showing how we can stay out of the courts, make the forests more healthy, and produce a steady supply of saw logs for the mills. Thanks.

Senator BARRASSO. Thank you, Senator Merkley.

Senator ROUNDS. Thank you, Mr. Chairman.

Mr. Fite, in your testimony you State that wildfires this season have been one of the worst on record. Now, according to the U.S.

Forest Service, fire seasons are now approximately two and a half months longer than in 1970. Just this month alone, KEVN News in Rapid City, South Dakota, has cited over 20 wildfires in the Black Hills National Forest. We are facing, in my opinion, a Federal forest management crisis.

If you could point to the most needed change to Federal management policy, what would that be, and why?

Mr. FITE. Thank you, Senator. The most needed change is simply a focus on actively managing our landscape and making sure that the Forest Service and the BLM, those are the two agencies with the most Federal forests, that is their No. 1 priority. Wildfires have to be fought when they come out, and it certainly costs a lot of money and we need to pay for it, but we need to be getting in there on the front end and making our landscapes more resilient so then, when a fire does come through, we don't get the destructive and catastrophic effects like we have seen this season and the past few seasons.

Senator ROUNDS. Let me just ask a specific, because the suggestion is that the type of management that you would suggest is clear-cutting forests. Can you talk about that for a minute? Is that really what the desired management practice is?

Mr. FITE. No, Senator, and I appreciate you asking the question. I think in one of the previous comments from the Committee there was a discussion of are we clear-cutting, are we removing fire-resistant trees. When we are going in and doing active management, there are different tools that agencies use in different circumstances, and in some cases you may want to create an opening or use former regeneration harvest. But a land management agency goes in and it uses its tools intelligently, knowing how the landscape is going to benefit. And we have seen research, particularly in California, that a little more intensive management can open up areas for prey for some of these iconic owl species; and that if you aren't going in and managing at all, that is, one, going to create this wildfire risk, but then you are not creating the prey base for these wildlife species that folks want to keep around.

Senator ROUNDS. Really, what you are talking about is a diversity within the Forest Service itself. You want some areas with grass; you want some areas with shrubbery; you want some areas where heavy timber stands are allowed, moved in. It is almost like managing a garden in many ways, isn't it?

Mr. FITE. I think that is a fair characterization, Senator. The Forest Service should be using all the tools at its disposal to make an active, healthy forest that produces all the multiple uses that they are designed for. And I think there are solutions out there with active management that can help give them those tools and help our communities as well.

Senator ROUNDS. In your testimony you indicated that there seems to be a disparity in outcomes between federally and non-federally managed forestlands. With all due respect to our Federal agencies and employees, I have seen this firsthand in the Black Hills in my home State, and it is often obvious from the condition of the trees themselves where federally managed forestlands start and where they end. A failure to properly manage forestland, or a lack of management entirely, is what leads to some of these very

dangerous conditions; fuel buildups, undergrowth that hasn't been addressed in some cases; old growth timbers that have not been thinned in some cases. And when you do have a pine beetle infestation or anything else, you end up with so much heat that you basically sterilize the ground; the heat gets so high.

Can you elaborate on what exactly the Federal Government is doing wrong as it relates to active forest management?

Mr. FITE. It is a combination of factors, Senator, and one of those factors is just the agencies' hands are tied. They have one hand tied behind their back by a number of these repetitive processes and then the litigation loop, so they are not able to get projects together at the scale or the pace that they need to get them together.

Senator ROUNDS. Ms. Crowder, very quickly, you testified that the permanent authorization of Good Neighbor Authority in the 2014 Farm Bill has been an important tool for getting work done on the ground. Can you explain how the Good Neighbor Authority, collaborating with the Forest Service and the Bureau of Land Management, has allowed you to better manage forests?

Ms. CROWDER. Absolutely. Thank you, Senator, Mr. Chairman. In the Black Hills of the national forests, we have seen, with State forestry and working with the Federal Government, as well as the National Wild Turkey Foundation, a Good Neighbor Authority project that actually does improve active management on the Black Hills. We have also seen some very particular projects on BLM lands in southcentral Wyoming, where we have been able to work with other entities, including the BLM and the Forest Service, through Good Neighbor Authority to do mule deer habitat improvement and to actually get some timber moved off of some of those areas before it is unusable.

Senator ROUNDS. Thank you.

Thank you, Mr. Chairman.

Senator BARRASSO. Thank you very much, Senator Rounds.

Senator GILLIBRAND.

Senator GILLIBRAND. Thank you so much, Mr. Chairman and Mr. Ranking Member, for holding this hearing.

Mr. O'Mara, in your written testimony you mention that the U.S. Forest Service is restoring just under 5 million acres per year. The U.S. Forest Service also estimates that approximately 65 million acres of Forest Service land is in need of some type of restoration. This seems to me to be an alarming gap between what needs to be done and what is actually being done to prevent wildfires.

Yesterday, Secretary Perdue said, during his press availability, that what we need is a "permanent funding fix" and that a legislative effort is not necessarily needed if a funding fix is provided.

Do you agree with Secretary Perdue that the major impediment to forest restoration efforts is primary lack of funding and resources? And what level of funding should Congress and the Administration be providing to carry out forest restoration projects?

Mr. O'Mara. Thank you, Senator. I absolutely agree with Secretary Perdue. During my testimony earlier, I was focused on that. You can have all the management tools in the world, but if you don't have the resources to get products on the ground, they are all for naught. And I think right now you are spending $2 billion between the Forest Service and BLM and the Interior agencies on

fighting these catastrophic fires, and that doesn't include the money that the Pentagon is spending and some State agencies are spending on top of it. So it is a massive number. And there has been good work by Senator Murkowski and Senator Udall and others in the appropriations process to try to put a band aid on the problem, but there is a great bipartisan bill that Senator Crapo has been working on with Senator Wyden and Senator Feinstein and so many others that I think is a perfect path to actually having the funding necessary.

My belief is that we should have a dedicated separate fund for fires, rather than trying to put it into the FEMA universe, because if there is another hurricane that hits New York or Delaware or somewhere else, those funds are not predictable enough. So there should be a separate funding source. And there is a model that I think has broad bipartisan support, at least in this body; and if we can move that quickly, it solves a lot of these other problems. And I would love to complement it with some good management improvements also to give folks more tools to do better projects.

But right now this restoration deficit, if you had all the money in the world, you would be able to restore a lot of that 65 to 82 million acres in the coming years, instead of this maybe, if we are lucky, over the next 20 or 30 years at the current rate of funding.

Senator GILLIBRAND. Well, I would like to work with you on those management ideas, because if we do get a vote on that bill in this Committee, I could offer an amendment to add that to the bill.

In your written testimony, you raised several concerns with S. 1731, the Forest Management Improvement Act. Among the concerns you raise is the reduction in transparency and public involvement that would be the result of the bill. What would the consequences of limiting the options that are looked at as part of an environmental review or environmental assessment for all forest management practices, and how would such a limitation affect the ability of the public to provide meaningful input in the process?

Mr. O'Mara. So, I am a big fan of collaborative processes, where you get folks on the ground together to come up with kind of solutions, and the 2014 Farm Bill actually had a great model for a lot of these individual exclusions to have a more collaborative process, and what they did there is they actually kept the environmental safeguards in place, but they really focused on empowering the collaboratives. And I think in this case there is a commonsense moderate middle between, and I think there is a bipartisan agreement where I think this overreaches on a few fronts. I think there is a more moderate place. None of us want to see projects that are collaborative blown up by the courts and things like that, but the answer isn't get rid of everything in the process and kind of throw the baby out with the bath water. So there is a middle ground that we would love to work with you and the Committee on finding, because we can get this done very well.

Senator GILLIBRAND. A major reason why we subject major projects and activities to an environmental review process is to ensure that the voices of the public and other stakeholders are heard before decisions are made. This allows, in many instances, potential conflicts and unintended consequences to be identified and re-

solved before a project moves forward, rather than trying to fix it after the fact.

For any of you, could you give us an example, either now or for the record, of how this process has worked well to resolve environmental issues before a project was implemented?

You could start, Collin.

Mr. O'Mara. Sure. I mean, I think there are incredible projects in places like Oregon and places like Montana that have had great collaborative processes that identified potential impacts to make sure you had the sportsmen interests for elk and big game kind of matched and making sure you don't have an adverse impact on things like raptors and owls and other kind of species. So having more voices at the table at the local level I think is the absolute best way to do this. And then what I would like to see is have those processes bolstered so they have greater weight in the courts. I mean, you shouldn't have somebody that wasn't part of the process be able to blow they up. We see that all too often.

And I think this is where Senator Daines' bill and Senator Tester's bill, of making sure we are not having to go back to the entire plan, but just kind of focus on a specific piece and getting the best science, best collaboration at that level is a commonsense moderate middle that can actually make sure these kind of projects that are good and collaborative actually advance.

Senator GILLIBRAND. Lawson.

Mr. FITE. Thank you, Senator. Certainly, in Idaho and Montana there has been a lot of progress. I was involved in a project recently in southern Idaho where we got on the phone with conservation groups and the Forest Service and worked something out.

Things are a little more difficult in Oregon. We have a collaborative project that is under litigation by a former member of a collaborative and a group that has participated in those processes, so I think that is a frustrating experience for folks when they go in that process and then there is still litigation.

Senator GILLIBRAND. Chairman, I am out of time. Could Jessica answer, though?

Senator BARRASSO. Ms. Crowder.

Ms. CROWDER. I will be brief. Thank you, Senator.

The collaboratives are important. We do have collaborative processes beginning in Wyoming. We are a little behind Oregon on some of those efforts. And I would submit to you that involving the people locally on the ground who live and work in these communities is of the utmost importance. However, I would also caution, and what we hear often from our constituents is we need immediate action; and they want to be involved in the process, but they want the process to lead to action on the ground. Thank you.

Senator GILLIBRAND. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you very much.

Senator BOOZMAN.

Senator BOOZMAN. Thank you, Mr. Chairman, Ranking Member. I apologize for being late; I was at a Veterans hearing talking about veteran suicide, which is also very important. But, also, this is very important too, in a different way.

Ms. Crowder, my State of Arkansas is very active in forest management on private, State, and some instances on Federal land. We

have a thriving timber industry that provides good-paying jobs for thousands of Arkansans. Further, Arkansas creates a net sequester of carbon at an impressive 16 million tons a year. It appears that investing in forest management is not only good for our environment, but it also boosts the U.S. economy.

In your testimony and in answers to questions, it appears, Ms. Crowder, that you feel like that the legislation that we are discussing, well, enhanced forest management practices would help with the forest fire situation. Am I correct in that?

Ms. CROWDER. Yes, sir.

Senator BOOZMAN. Do you view increased forest management as a way for the United States to reduce its carbon footprint?

Ms. CROWDER. Yes, sir. Trees are important; they are carbon holders, carbon capture, so they are of the utmost importance to having healthy forests, to having healthy people, to having a healthy environment; and active management of those trees only increases those opportunities.

Senator BOOZMAN. Would you all comment, if you would?

Mr. FIT. Well, I will comment very quickly. I met with one of our members, one of our sawmill members, and he said, you know what I do? I sequester carbon. By putting wood into products like the paneling in this room, we are sequestering carbon and we are storing it in our forests. And if we have these catastrophic wildfires, then we are releasing amounts of carbon that could be stored in those forests and kept there with good active management.

Mr. O'Mara. Thank you, Senator, and thank you for the question. The estimates have ranged anywhere from 50 million metric tons of carbon go off every year from these wildfires to 150 million. Just by way of comparison, all the refineries combined across the entire Country is about 220 million metric tons. So it is a lot. So, if we can improve management of our forests in a constructive way that reduces some of these catastrophic fires, the emission savings are significant; and, frankly, I would rather have it be in the trees, in the older trees and the larger trees, and actually have some local jobs as a result, also.

Senator BOOZMAN. Very good. Thank you.

Mr. Fite, as you know, forest management is generally a bipartisan issue. Do you believe the legislation in front of us today effectively promotes a healthy environment, while getting rid of redundant processes that put our Country at greater risk of catastrophic wildfires? And I think it kind of goes to the comment that Ms. Crowder said a few minutes ago about the need, when you talk to individuals on the ground, the locals, getting something done now. But we have redundancies and we just have a paralysis of action.

Mr. FITE. Absolutely, Senator. Forestry is a bipartisan space, and it is really encouraging that there are so many bills, particularly the litigation reform bill sponsored by Senators Daines and Tester also has bipartisan support in the House, and that is so encouraging because it is so important to our communities and to our ecosystems. We can do a lot of things that are win-win, where we are increasing the health of our forests, but we are also increasing the stability of our communities. And one of the great things about forestry is it provides jobs in rural areas that are blue collar and mid-

dle class; and there aren't as many jobs in this Country like that as there used to be, and that is a great thing for America.

Senator BOOZMAN. Very good.

Thank you, Mr. Chairman.

Senator BARRASSO. Thank you, Senator Boozman.

Senator CARPER.

Senator CARPER. Thanks, Mr. Chairman.

Collin, I will come back to you on the first question. Could you just take a minute and explain the relevance of the term categorical exclusion to this discussion? And then I am going to ask you some more specific questions.

Mr. O'Mara. Sure. So the categorical exclusion is a way to have a project that is defined that basically avoids the need for the same level of environmental analysis that would be required under the National Environmental Protection Act, and I think they have been used very strategically in some places, in the Farm Bill. I used a couple examples of that. The administrative agencies also have some authority to have narrowly crafted ones. And it is a way to basically expedite the review of projects by not having the same level of scrutiny.

Senator CARPER. I understand that the Forest Service has authority, I think explicit authority, to use categorical exclusions up to, what is it, 3,000 acres now? And I understand they have used it not hundreds of times, but maybe 30, 40 times, something like that. On average, I believe it is about roughly 1,000 acres at a time. And we have heard testimony today that they have not fully utilized this authority.

Your testimony expresses strong concern about proposed new categorical exclusions up to what, I think 10,000 acres. Could you talk more about the unintended consequence of implementing such a broad exclusion, particularly before the Forest Service has fully implemented its existing authorities and before Congress has addressed the agency's funding needs?

Mr. O'Mara. Sure. There is kind of two parts to the proposal. One is increasing the acreage and the second is kind of reducing the other kind of collaboration and the restoration intent that some of the other exclusions have. So what we would like to see is a more narrow focus on projects that actually have a restoration purpose, and I think we actually see that in the mule deer bill, the stage grouse bill that Senator Hatch and Senator Heinrich have been working on; and at the same time still encourage things like collaboration and having some level of protection.

So we just don't think it is absolutely necessary, given that the vast majority of projects that the Forest Service is looking at using this particular exemption for right now are about 1,000 acres, as you mentioned, not even reaching the full 3,000. So I think the deal that was the bipartisan agreement from the Farm Bill in 2014 was a pretty good one. I would love to have them have more resources and more tools to use that existing exemption, as opposed to going further for something they really don't need yet.

Senator CARPER. OK, good. Thanks. That was helpful.

Ms. Crowder, somewhere in your testimony you mention that the State of Wyoming—have you always lived in the State of Wyoming?

Ms. CROWDER. I am sorry?

Senator CARPER. Have you always lived in the State of Wyoming?

Ms. CROWDER. I have been there about 13 years.

Senator CARPER. I was in Wyoming last weekend, Camden, Wyoming. It is a little town just south of Dover, Delaware. I go there a lot, and I always say to John Barrasso, our Chairman, and Mike Enzi, I was in Wyoming last weekend. It is a different one. I have been there a couple times. Lovely place. Lovely place. The real Wyoming, the really big one.

But you mention in your testimony that your home State, your native State requested that the Forest Service uses authorities enacted in the Farm Bill we were talking about earlier, 2014 Farm Bill, but the agency has not yet done so. And I just want to ask you if you think this is in large part because the Forest Service's budget is inadequate and the agency has to spend more than half of its budget fighting fires.

Ms. CROWDER. Yes, sir. Fire borrowing is a real concern, and Governor Mead shares that concern and would like to see a fix to the fire borrowing issue. Essentially what it does is it takes away opportunities for us to get some active management done on the ground, as well as other projects, recreation projects, habitat enhancement projects, and others.

In Wyoming, categorical exclusions related to insect and disease designation areas under the 2014 Farm Bill have not happened yet. That is not only because of the fire borrowing issue; it is because of a hesitancy to utilize the tool and also because there are many instances where a larger action is necessary. So chipping away 3,000 acres at a time on a forest like the Medicine Bow National Forest won't make the results happen as quickly and it won't be as useful as we would like to see.

Senator CARPER. OK, thanks.

I have maybe one question, but for the next round?

Senator BARRASSO. Go ahead.

Senator CARPER. OK, thanks.

This would be for all witnesses, but I am going to start off, if I could, Mr. Fite, with you.

According to the Forest Service's NEPA handbook, the agency has, I don't know, 30, 40, maybe 35 categorical exclusions at its disposal. Do you believe these exclusions are being fully utilized? If not, why do you think they have not been fully utilized? And do you have specific recommendations on how they could be better utilized?

Mr. FITE. Thank you, Senator. The categorical exclusions, many of them are being utilized, but they are for very small pieces of work, for 70-acre treatment or there is a categorical exclusion for facility maintenance. So many of these categorical exclusions don't really make a difference on the landscape.

As far as barriers to using categorical exclusions, I will say I think Region I of the Forest Service has done a really good job using the Farm Bill authorities. They already have 15 projects, just Montana, northern Idaho, North Dakota. Certainly, budget is an issue, but making sure that we can streamline authorities ensures that money will be spent wisely and it gets a good return, because

the difference between a categorical exclusion and an EA versus an EIS can be significant time and significant taxpayer dollars.

Senator CARPER. All right.

Collin.

Mr. O'Mara. I do think that we have gotten better at this the last few cycles and we have seen some improvement. There is a really great idea that the Nation Conservancy and the National Wildlife Federation and Senator Cantwell and Senator Murkowski have been talking about, kind of like these landscape scale plans where you basically try to do habitat restoration at scale and then use it through an EA process as a way to kind of expedite the review, but as opposed to every individual small project kind of looking at scale.

So I think what we would argue is that we could use the EA process much more efficiently and not need the full-blown EIS, kind of NEPA analysis, and that is a better solution, from our point of view, than having a bunch more categorical exclusions that may or may not be used. So I think there is a better mousetrap to get the same exact result on the ground in a way that can be much more bipartisan.

Senator CARPER. OK, good.

And Ms. Crowder.

Ms. CROWDER. Yes. Categorical exclusions, I agree with these two gentlemen, do not provide the needs that we have in Wyoming, in Region II and Region IV of the Forest Service, across several of our forests that are just devastated, and that is my concern. I am sorry, categorical exclusions do provide that opportunity. So when we don't see those categorical exclusions used because they don't provide the bang for your buck that is needed in some of these areas that are truly devastated, that is where the concerns come in.

We do have two projects that are very close to 3,000 acres that are starting to move forward under the insect and disease designation areas permitted in the Farm Bill of 2014; however, it is slow. It has been very slow. And we would like to see that use be improved and expanded. And I think that streamlining NEPA as a whole for environmental assessments and environmental impact statements is also necessary and a very good tool.

Senator CARPER. All right.

The last thing I would ask is sometimes when we have issues for which there is not yet unanimity, we look to a panel like you. You don't see all these issues entirely the same, but there is a lot of consensus. Just a closing word or two, some counsel for us, as we try to move forward with these bills, just to keep in mind. Anything, any last thought that you have, we would appreciate it.

You want to go first, Ms. Crowder.

Ms. CROWDER. Thank you, Senator, Mr. Chairman. I think that, in closing, for Wyoming and the rest of the Country, what is important here is immediate action, an opportunity to evaluate what we really want our forests to look like, how we really want our forests to function. Do we want them to provide ecosystem benefits and jobs for our economy? Do we want them to be a great place to recreate and for visitors to enjoy, for wildlife? Yes. So we need to

evaluate what those goals actually are for our forests and what are the steps to actually get there.

In Wyoming, we are concerned with management being too small, at two small a scale to get to the level of management that we would like to see, and to see the healthy forests that we really do want and that are very important to our citizens.

So thank you for the opportunity.

Senator CARPER. No, we are grateful to you. Thank you.

Mr. FITE.

Mr. FITE. Thank you, Senator. In closing, some words to go on, we have a great opportunity with active management to create healthy forests that support our communities and support many of the other uses of the national forests, which are great multiple-use lands for timber production, recreation, and all sorts of other uses. What we need, though, is a comprehensive approach, because merely fixing a budget approach without giving the Forest Service and BLM more management authorities isn't going to get us to where we need to be with an actively managed healthy landscape, because if we just send money at the problem—and I agree the wildfire funding problem needs to be fixed, and we in industry support fixing that, but without some management reforms, we are not going to get the management outcomes that we need on our national forests. And we in the forest product industry, we stand ready to partner across the aisle, across the spectrum to create solutions and support approaches that will create good results on the ground.

Senator CARPER. All right. Thanks.

Mr. FITE. Thank you for the opportunity.

Senator CARPER. Collin, last word?

Mr. O'Mara. Thank you, Senator. There is an opportunity of a big bipartisan agreement here if we focus on the things that are truly bipartisan, and I think the fire funding crisis fix I think is bipartisan in the Senate. I think we have gotten really close a few times. I think the bills you have before you, with Senator Tester and Senator Daines, as well as Senator Thune and Senator Hatch, I think those are bipartisan. I think that with some more thought, I think there are some pieces of the Thune bill, in Senator Thune's bill that could be bipartisan. But speed is of the essence.

We have been stranded. We have lost kind of goal line stands several times on this issue in the last several years, so I think we can't let perfect be immediately good and I think we have to be rational on all sides, and frankly it comes back to your three Cs, right? Collaboration and compromise. And we could get this done by the end of the year. I mean, this could be one of the biggest national resource bills that has gone through this body in years. But I think everyone is going to have to be legitimately compromising to get there.

Managers absolutely need more tools and managers absolutely need more resources, and if we focus on outcomes like wildlife habitat and forest resilience and watershed health and local recreation and local jobs, there is a solution there; and we would love to work with both of you to make that happen.

Senator CARPER. Great. Thank you so much. Thank you. Great to see you. Thank you.

Senator BARRASSO. Thank you, Senator Carper.

I ask unanimous consent to include a record letter, number of different articles on wildfires into the record.

Senator CARPER. I object.

Senator BARRASSO. Without objection.

Senator CARPER. I don't object.

Senator BARRASSO. Objection is overruled.

[Laughter.]

[The referenced information follows:]

Cause of most US wildfires traced to people, study finds

Firefighter Dave Calvert, with Sweetwater County Fire, helps mop up the Berry Fire on Aug. 27 in Grand Teton National Park. Between 1992 and 2012 more than 80 percent of wildfires were human-caused.

People have triggered five out of six wildfires in the U.S. over the last two decades, tripling the length of the wildfire season and making it start earlier in the East and last longer in the West, a new study finds.

Even as climate change worsens the nation's fire season — making it longer and easier to burn more acres — researchers said human activities play an even bigger role.

While fire experts have long blamed people more than lightning, the new work details the extent of human-caused ignitions and how they interact with global warming to make matters worse.

Scientists analyzing fire data from 1992 to 2012 found that 84 percent of all U.S. wildfires — but only 44 percent of the total acres burned — were started by people, either by accident or on purpose. And human-caused blazes have more than tripled the length of the wildfire season from 46 days to 154 days, according to a study in Monday's journal Proceedings of the National Academy of Sciences.

"People are moving more and more into natural wild areas and essentially providing ignition for wildfires," said lead author Jennifer Balch, a fire ecologist at the University of Colorado.

The spark

Of the more than 1 million human-started fires since 1992, about 29 percent began by trash burning, another 21 percent were arson and 11 percent were from misuse of equipment, Balch said.

Last year's Soberanes fire in California was sparked by an illegal campfire and burned for nearly three months. The blaze surpassed $200 million in firefighting costs, the most expensive in U.S. history.

One out of every five wildfires occurs on the Fourth of July from fireworks, Balch said.

The hottest spots

The Southeast is a hot spot for human-triggered wildfires. Kentucky, Virginia and Tennessee had fire seasons that lasted more than 200 days and 99 percent of the wildfires in those states are caused by people.

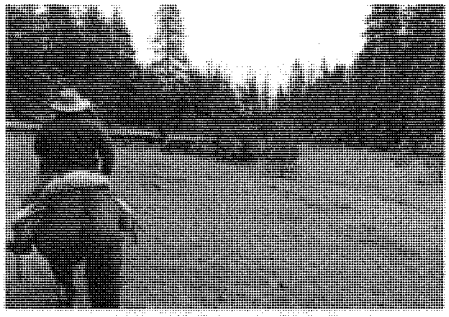
The region is home to swaths of forests with trees that don't catch fire easily or naturally so people are the main culprits, said study co-author Adam Mahood of the University of Colorado.

The climate connection

Climate change has lengthened the U.S. fire season by a few weeks, which is dwarfed by what humans do. But the study shows how both human-sparked flames and man-made climate change work together to make America burn more, especially during more frequent dry, hot weather.

"If a campfire grows out of control during a wet, cool period, then it probably isn't going to grow into a large wildfire," said University of Utah fire scientist Philip Dennison, who wasn't part of the study. "Climate change loads the dice toward warmer, drier conditions that make it more likely that a fire will develop from human-caused ignitions."

Department of Interior Review Threatens Cascade Siskiyou National Monument By: Matthew Renda June 20, 2017



Soda Mountain Wilderness Council Executive Director Dave Willis rides his horse Chance through a meadow in the Cascade-Siskiyou National Monument.

(CN) — Dave Willis rides a mid-size gelding named Chance through towering firs interspersed with ponderosa and lodgepole pine as spruce and hemlock hover over a forest floor covered with Jurassic fern. As the executive director of the Soda Mountain Wilderness Council navigates through the southern reaches of the Cascade Range, lichen hang from the branches of the coniferous trees, swaying in the wind. At mid-June, the wildflower bloom is nearing its peak.

The weather forecasters called for afternoon thunderstorms, but the rain has stayed away all day, and the forest is awash in quiet except for wood snapping under the horse's hooves.

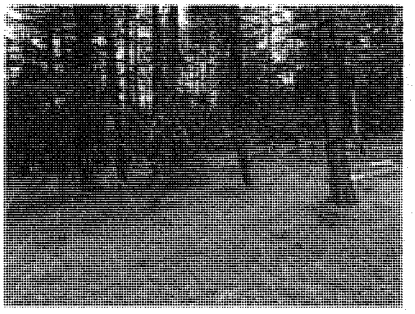
"This is a classic old-growth remnant forest," Willis says. "You don't see much of these around anymore."

This forest is intact, retaining the character it's maintained for centuries, because of the conservation endeavors of Willis, his organization and the many allies that contributed to the effort to create and expand the Cascade-Siskiyou National Monument.

The monument straddles the California/Oregon border, encompassing roughly 87,000 acres of forest, grassland and mountain peaks in the region where the Cascade Range collides with the geologically distinct Siskiyou Mountains.

"This is the only monument established for the sole purpose of preserving biodiversity," said Shannon Browne, the community-partnerships director for the Friends of the Cascade-Siskiyou National Monument and a proponent of preserving the monument's current borders.

The monument was established because the area represents an intersection of several different biological zones. On its eastern fringe, a portion of the Klamath Basin hosts the same array of vegetation – including sagebrush and juniper – found elsewhere in the Great Basin that covers territory spanning Utah, Nevada, Idaho, California and Oregon.



An overlook in the Cascade-Siskiyou National Monument affords a glimpse of the rolling scrub oak grassland toward Ashland, Oregon

To the south, the Siskiyou Mountains, an approximately 100-mile coastal mountain range that begins at Crescent City, California, has its terminus at the monument. The range brings its own mix of flora and fauna, including coastal Douglas fir, California white fir, Lawson's cypress and the distinctive weeping spruce, as well as the endangered Siskiyou Mountains salamander.

The monument not only features the aforementioned forests of the Cascade Range but also encompasses the oak woodland typical of the western slope of the Sierra Nevada. These biological zones do not remain distinct and apart within the monument, but instead intermingle in what Willis describes wryly as an "ecological mulligan stew."

"It's the most botanically diverse coniferous forest in North America, if not the world," Willis said.

Browne agrees, calling the area of "global botanical significance."

Willis said the monument not only preserves biodiversity but provides regional connectivity.

"Klamath Siskiyou is the most botanically diverse coniferous forest in North America, if not the world," Willis said. "And if Klamath Siskiyou is the Noah's Ark, Cascade-Siskiyou is the loading dock to the ark."

Ecologists who worked with federal land management agencies such as the Bureau of Land Management first recognized the significance of the area in the early 1980s.

That was when Willis became involved in advocacy for the preservation of the area that is now the monument, although the first push was to get a "wilderness area" designation, which carries much stricter development prohibitions than monument status does.

Willis got his wish in 2009, when former President Barack Obama designated a 24,000-acre swath inside the monument as the Soda Mountain Wilderness, making any type of development on those lands forbidden.

But this designation highlights the complicated land-use picture inside the monument, which is as diverse in its own way as the biodiversity of the territory it aims to protect.

Former President Bill Clinton originally designated 38,774 acres, all of which was in Oregon, as the original Cascade-Siskiyou National Monument in 2000, months before relinquishing the Oval Office to George W. Bush.

The Soda Mountain Wilderness designation came as part of an omnibus bill in 2009, signed by Obama. Obama also expanded the national monument by 48,000 acres – including about 5,000 acres of Northern California – on Jan. 12 of this year. Current President Donald Trump took office eight days later.

A view of the newly expanded Cascade-Siskiyou National Monument. Most of the land shown to the right is O&C Land and is disputed by timber companies and an association of Oregon counties. To the left, forests depleted by timber production are visible.

Not only was the designation of the monument done piecemeal, but the land inside the monument is comprised of public lands managed by the BLM and private lands held by timber companies for the purpose of harvest, cattle ranchers and other private citizens. Within this vortex of users, interests often conflict.

Further complicating the picture, the 48,000-acre expansion included about 40,000 acres of Oregon and California Railroad Revested Lands, commonly known as O&C Lands.

O&C Lands comprise about 2.6 million acres of land in western Oregon that were ceded to the owners of the Oregon California Railroad in 1916 for the purpose of building a railway between San Francisco, California, and Portland, Oregon. The BLM now manages much of that land, which spans 18 counties.

In 1937, the United States Congress passed the O&C Act, which directed the BLM to harvest timber on the lands and to use the proceeds to fund various programs – such as education – in the counties.

Using timber as a funding mechanism has recently encountered some turbulence, however, as concerns about environmental degradation, habitats for endangered species such as the spotted owl and the preservation of old-growth forests have slashed proceeds from timber sales to a mere fraction of what they were at their peak in 1989, bringing in $1.5 billion annually.

The timber industry and county officials that depend on those proceeds to fund schools, law enforcement and other social services view Obama's

decision to expand the monument as yet another encroachment on the region's economic viability.

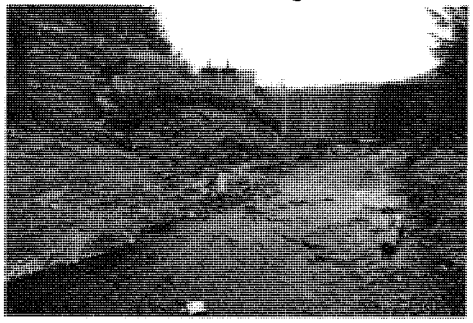
This tension has fueled lawsuits filed by three different entities in various federal court jurisdictions, all centering on the legality of Obama's expansion of the monument.

"The reason we brought this lawsuit is to make sure the law was followed," Lawson Fite, an attorney with the American Forest Resource Council, said in an interview. "Our lawsuit asks the question: Does the president have unilateral authority to disregard a congressional statute that set aside O&C lands?"

The American Forest Resource Council and the Association of O&C Counties both filed suit in the District Court for the District of Columbia; Murphy Timber, which owns swathes of private land in the monument, filed suit in Oregon's federal court.

All three lawsuits have been stayed after Secretary of the Department of Interior Ryan Zinke announced he would review whether the expansion and designation of the Cascade-Siskiyou National Monument was done in concert with the law and the full input of all stakeholders.

President Trump ordered the DOI review of the Cascade-Siskiyou National Monument – along with 21 other national monuments located in 11 mostly western states – calling the designations by previous presidents under the Antiquities Act "a massive federal land grab."



A waterfall flows in the Cascade-Siskiyou National Monument.

The three plaintiffs in the lawsuits agree with Trump's summation that Obama's monument expansion has "unilaterally put millions of acres of land

and water under strict federal control, eliminating the ability of the people who actually live in those states to decide how best to use that land."

All three organizations say the restrictions on timber production on federal lands in Oregon has had disastrous consequences for the local economy.

"Dozens of sawmills have been forced to curtail operations or close entirely due to a lack of adequate supply," Fite said in the American Forest Resource Council complaint. "Logging companies have been left idle and forced out of business due to a lack of work. Timber communities have lost thousands of family-wage forestry jobs; the type of jobs that paid enough to allow men and women to provide their families with a high quality of life."

Moreover, Fite said the timber industry is interested in productive and healthy forest management, noting that a hands-off style includes fire-suppression tactics that lead to catastrophic wildfires, infestations of pests like the bark beetle and forests more susceptible to drought.

"It leads to conditions that are quite unhealthy and even dangerous," he said.

This stretch of forest lies within the Cascade-Siskiyou National Monument, but it is owned by a private timber company that has harvested many of the large trees on the property.

Willis contends this is just empty corporate shibboleth that the timber industry has been spouting for years. He says he has taken hundreds of interested parties on horseback rides through the pristine remnant forests to show them the stately pines draped in light green lichen framing sun-sapped meadows. He invites the riders to compare the scene before them to areas of the forest that have been clear-cut.

Even where the timber industry has avoided clear-cutting and has instead taken 40 percent or 60 percent of the trees, as mandated by BLM

management plans, the forests are starkly different from their natural state, Willis said.

He also noted that 24,000 of the 40,000 O&C acres have been designated as preserved for recreation, meaning those forests couldn't be harvested for timber anyway. That leaves only 16,000 acres of potential timber harvest that were set aside by Obama.

Browne said opponents to the monument have propagated a lot of misinformation, such as telling hunters they will no longer have access to the land and worrying property owners that onerous restrictions will be imposed on their private property.

Willis said these and other myths about the import of a monument designation are simply untrue.

"If I believed half of the things opponents said about the monument, even I would be against it," he said.

Both Willis and Browne said that despite half-truths and misleading information, public enthusiasm for the monument has been overwhelming, with supportive comments outweighing opposing ones nearly 4 to 1 at many of the public scoping sessions.

Furthermore, Native American tribes – many of whom have ancestral ties to the lands – back the expansion, as Don Gentry, Chairman of the Klamath Tribes, noted in a letter to Oregon Senator Jeff Merkley.

"Our people have significant historic and current ties to and uses of this area," Gentry wrote. "It is the position of the Klamath Tribes that the proposed expansion would better provide for and protect our current traditional, religious, cultural uses, values, and interests."

Merkley, Senator Ron Wyden and Oregon Governor Kate Brown have all come down in support of the monument expansion, as have the city councils of the nearest two towns – Ashland, Oregon, and Talent, Oregon.

"There is huge public support for this monument from the local communities and state," said Kristen Boyles, an Earthjustice attorney who is defending the national monument cases.

Boyles said that the plaintiffs' legal argument hinges not only on whether the U.S. President can use the Antiquities Act to trump an act of Congress, which

she believes is legal, but also whether the designation of O&C lands as strictly for timber production will hold up to court review.

Unsurprisingly, she is confident it will not. According to her, those lands were always meant for a variety of uses, not simply timber production.

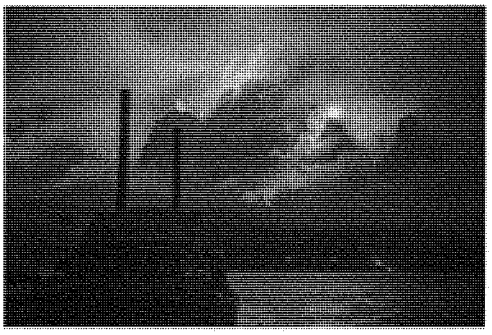
In fact, she does not believe the current review process undertaken by Zinke should apply to the Cascade-Siskiyou National Monument at all because of the extensive public process that took place before the designation, coupled with widespread public support by those in proximity to the lands.

"This monument doesn't fit the pattern of the DOI review, and yet here we are because of one industry that has a very narrow view of how federal lands should be managed," Boyles said.

An overlook affords a spectacular overview of the Cascade Siskiyou National Monument.

Courthouse News has been providing in-depth features on some of the national monuments targeted for closure or reduction by the Trump administration, including the Hanford Reach National Monument in Washington, The Upper Missouri River Breaks National Monument in Montana, and the Papahanaumokuakea Marine National Monument in Hawaii. Click here for more CNS coverage on national monuments.

The US West had a snowy winter, so why the fiery summer?



By Dan Elliott, AP DENVER — Sep 8, 2017, 10:20 AM ET
Acrid yellow smoke clogs the skies of major Western U.S. cities, a human-caused fire in the Columbia River Gorge rains ash on Portland, Oregon, and a century-old backcountry chalet burns to the ground in Montana's Glacier National Park.

Wildfires are chewing across dried-out Western forests and grassland, putting 2017 on track to be among the worst fire seasons in a decade.

A snowy winter across much of the West raised hopes that 2017 wouldn't be a dried-out, fire-prone year, but a hot, dry summer spoiled that.

Here's what happened, and how bad things are:

HOW DID WE GET HERE?

Heavy snows last winter brought relief from a long, brutal drought across much of the West and produced a lush growth of natural grasses — thicker and taller than many vegetation experts had ever seen. But the weather turned very hot very fast in the spring, and the snow melted much faster than expected.

All the grass that grew high dried out, and so did forests at higher elevations, leaving plenty of fuel for wildfires, said Bryan Henry, a manager at the National Interagency Fire Center, which coordinates wildfire-fighting.

Summer lightning storms then dumped less rain than usual and weather conditions kept the humidity low, creating a natural tinderbox in many states.

"It was kind of a bad combination of things," Henry said.

HOW BIG ARE THE FIRES?

By Thursday, more than 76 large fires were burning in nine Western states — including 21 in Montana and 18 in Oregon, according to the interagency fire center.

So far this year, wildfires have burned more than 12,500 square miles (32,000 square kilometers) nationwide. In the past decade, only two years were worse at this point in the wildfire season: 2015 and 2012.

For all of 2015, a record 15,800 square miles (41,000 square kilometers) burned. In 2012, 14,600 square miles (38,000 square kilometers) were scorched.

WHAT ABOUT CLIMATE CHANGE?

It's making things worse for fires, said Jonathan Overpeck, dean of the School for Environment and Sustainability at the University of Michigan.

Hotter and drier weather is a symptom of human-caused climate change, and that's making fires worse by leaving forests and other vegetation more flammable.

"It's not of course playing the only role," he said. "There's natural variability at work."

"Humans are contributing to an ever-increasing degree to wildfires in the West as they emit greenhouse gases and warm the planet and warm the West," Overpeck said.

TREE-EATING BEETLES

Two dozen species of beetles have killed trees on nearly 85,000 square miles (220,000 square kilometers) in the Western U.S. since 2000. They're responsible for about 20 percent of the 6.3 billion standing dead trees across the West, according to the U.S. Forest Service.

Researchers disagree on whether forests with beetle-killed trees are more likely to burn, or if they burn differently, than healthier forests.

Any standing dead tree — whether killed by beetles, drought, lightning or other causes — can crash down, posing hazards for firefighters who must adjust their tactics to avoid them.

WHO'S FIGHTING THE FIRES?

More than 26,000 people are fighting the fires, backed by more than 200 helicopters, 1,800 trucks and 28 air tankers dropping water and fire-retardant slurry. Three of those tankers are military C-130 planes.

The military has also assigned surveillance aircraft and at least 200 active-duty soldiers to fight fires and the National Guard has been called out in at least four states — California Montana, Oregon and Washington.

"We're stretched thin," said Jennifer Jones, a spokeswoman for the interagency fire center.

Sometimes the center gets requests for more crews and equipment than it has, so "fire managers on the ground are adjusting their tactics and strategies to accommodate the resources they can get," Jones said.

"We don't pack up our tents and go home."

HOW BAD ARE THE LOSSES?

Nine firefighters have died and 35 have been injured this year, according to the national Wildland Fire Lessons Learned Center. Two of the deaths came during training.

Fires have destroyed an estimated 500 single-family homes and 32 commercial buildings this year, the interagency fire center said.

Janet Ruiz of the Insurance Information Institute sees a hopeful trend in fewer houses lost to wildfires in recent years. Ruiz credits better-equipped firefighters and homeowners who take steps to minimize the danger such as clearing trees away from buildings and installing screens over dwelling openings to keep embers out.

"It's a better-informed public and fire services better able to fight fire," she said.

WHAT ABOUT ALL THE SMOKE?

"It's unusually bad," said Henry, of the National Interagency Fire Center.

Smoke is lingering from northern California and central Nevada to Montana. The air over parts of northern California, Idaho, Montana, Oregon and Washington is rated very unhealthy on the U.S. Environmental Protection Agency's AirNow website. It was not clear whether sources other than fires were contributing.

The air over the towns of Cottonwood and Porthill, Idaho, were listed as hazardous, the worst of six categories.

Fires spew particulates into the air, which are linked to premature death and cancer and can make asthma and chronic lung disease worse, said Dr. Norman H. Edelman, a senior science adviser to the American Lung Association.

"It certainly is bad enough to cause symptoms in people with chronic lung disease but also normal people," he said.

A volcanic eruption is probably the only thing that pumps more particulates into the atmosphere at once than a fire, he said.

HOW MUCH HAS FIREFIGHTING COST?

Federal spending to fight fires appears to be headed for a record.

The two main firefighting agencies, the U.S. Forest Service and the U.S. Department of Interior, report spending of more than $2.1 billion so far. That's about the same as they spent in all of 2015, the most expensive wildfire season on record.

Those figures do not include individual state spending, which no single agency compiles. Montana has spent $50 million, exhausting its firefighting reserve fund in just over a month. Oregon has spent $28 million, but the state expects to be reimbursed for part of that by the federal government and others.

WHEN IS IT GOING TO GET BETTER?

The outlook is bleak for Montana, most of the Northwest and much of California through September, according to the interagency fire center. The fire risk is expected to remain very high in Montana and the Southern California coast through October.

Montana is gripped by a long, severe drought. Nearly a quarter of the state, near the northeast corner, is rated as in a state of exceptional drought, the worst of five categories on the federal government's U.S. Drought Monitor.

DON'T SOME FIRES HELP THE ENVIRONMENT?

Yes. Fires can burn away undergrowth, preventing buildups of flammable vegetation that can make big fires even worse. They can also help some forests and grassland rejuvenate.

But very hot fires can damage the soil and make it water-resistant, which produces heavy runoff during rainstorms and snowmelt, which in turn can cause severe erosion, mud slides and floods.

Silt from fire-damaged valleys can clog streams, which kills fish.

The silt can also settle to the bottom of reservoirs, taking up space needed to store drinking water and forcing utilities to spend heavily to dredge it out.

This story has been corrected to say the Columbia River fire rained ash on Portland, rather than raced toward Portland.

Associated Press writers Matt Volz in Helena, Montana, and Andrew Selsky in Salem, Oregon, contributed to this report

Thinning Forests Aims to Reduce Fire Risk

The Nature Conservancy is selectively logging dry forests in Washington's Central Cascades as part of a long-term plan to make thousands of privately owned forestland more resilient to fire, disease and climate change.

In this Feb. 22, 2017, photo, a log yarder hauls a log up a steep slope where a crew is thinning a 100-acre patch on private land owned by the Nature Conservancy overlooking Cle Elum Lake, in Cle Elum, Wash. As part of a broader plan by the nonprofit environmental group to restore the pine forests of the Central Cascades so they are more resilient to wildfires and climate change, they're cutting down trees to save the forest. (AP Photo/Elaine Thompson) The Associated Press

By PHUONG LE, Associated Press

CLE ELUM, Wash. (AP) — To restore a forest and reduce the risk of severe wildfires, a conservation group is cutting down trees.

The Nature Conservancy is selectively logging dry forests in Washington's Central Cascades as part of a long-term plan to make thousands of privately owned forestland more resilient to fire, disease and climate change.

A century of wildfire suppression has resulted in overgrown tree stands that are ripe for fire, so the group is weeding out smaller trees that can serve as kindling for fires. They're leaving bigger, older and

more fire-resistant ponderosa pines while removing tree species such as grand fir that are more susceptible to fire.

"We're changing how the fire would burn, and changing it from severe to a fire that would be good and would maintain forest health," said Ryan Haugo, senior forest ecologist at The Nature Conservancy. "We're trying to mimic the role that fire would naturally play."

The restoration thinning project outside the city of Cle Elum mirrors numerous projects in forests across the U.S. West, mostly on federal public lands, aimed at preventing wildfires and restoring forest health.

The project by a private landowner also represents a fraction of the millions of acres that some say need to be treated to prevent the kind of intense wildfires that have scorched thousands of acres across the U.S. West.

A 2014 analysis by The Nature Conservancy and the U.S. Forest Service identified more than 11 million acres (4.45 million hectares) of dry forest in Oregon and Washington that are in need of restoration.

Not everyone agrees on what role thinning should play in restoring forests or at what pace and scale it should happen.

Some say thinning, if not done right or strategically, may cause more harm than good, especially when new roads are built or commercial logging is done in remote or sensitive areas. Others worry that too often restoration is used as an excuse to commercially log more public lands.

Dominick DellaSala, chief scientist of the Geos Institute in Ashland, Oregon, said thinning that's done right can be a good tool but it's not the only one.

"I don't see it as a panacea and it should be strategically used to defend homes and lives and get into the truly flammable area," he said. Often missing from the equation is letting fires burn naturally under safe conditions, he added.

On a cold winter day, a small local crew hired by The Nature Conservancy used a yarder, a large piece of logging equipment that relies on a cable system, to haul freshly cut trees, some about 100 feet (30 meters) in length, up a steep hill to the snow-covered road.

For much of the past winter, the crew has been thinning about 100 acres of dense forestland high above Cle Elum Lake.

The land is part of nearly 75 square miles (194 sq. kilometers) on the east slopes of the Cascades that the conservation group bought from Plum Creek Timber in 2014 with the goal of protecting wildlife habitat and water quality and providing recreation access while also actively managing the forest, including logging to pay for restoration activities.

Once the logs are stacked in a pile, another worker revs up a chain saw and trims out smaller limbs. He marks them for length so they can be hauled to saw mills in the state where they are sold for timber products.

In places where they can, the group is trying to produce income to offset costs of managing the land as well as provide local jobs.

"What we're trying to show is that this is sustainable. You can make a profit here and treat a lot of these forests that need to be treated," said Brian Mize, Central Cascades field forester for the Nature Conservancy.

"Just doing nothing, I think we what know the results are going to be, especially in the context of climate change."

Copyright 2017 The Associated Press. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

Wildfire Causes

Wildfires can be caused by nature—like lava or lightning—but most are caused by humans. As many as 90 percent of wild land fires in the United States are caused by humans. Some human-caused fires result from campfires left unattended, the burning of debris, negligently discarded cigarettes and intentional acts of arson. The remaining 10 percent are started by lightning or lava.

Cigarettes are one way humans can cause fires.

Nature and Wildfire

Lightning is described as having two components—leaders and strokes. The leader is the probing feeler sent from the cloud. The return streaks of light are a series of strokes that produce the actual lightning bolt or flash that we see.

There are two types of lightning—cold lightning and hot lightning. Cold lightning is a return stroke with intense electrical current but of relatively short duration. Hot lightning has currents with less voltage, but these occur for a longer period of time. Fires are usually started by unusually long-lasting hot lightning bolts.

Lightning is one of the two natural causes of fires.

Senator BARRASSO. Mr. O'Mara, if I could, just following up on what you were talking about. You mentioned catastrophic wildfires, tens of billions of dollars in damages, local communities, the economies. So many of the populations depend on the great outdoors to sustain the economies. We have had these catastrophic fires. They affect hunting, fishing, hiking, all of the activities. Can you talk a little bit about just the impact on the outdoor economies that is impacted?

Mr. O'Mara. Yes. And I think we haven't done a good job quantifying this, but this year, using Senator Daines' and Senator Tester's hometown, all the folks who tried to go to Glacier that couldn't visit this year, that is a massive loss of impact on Kalispell and Whitefish and all those communities up there. I was in Jackson just a few weeks ago and there was still haze in the air, still affecting local kids and local schools.

So you are talking about tens of billions of dollars of impact on the ground on the physical assets. You are probably talking, you know, 30, 40, $50 billion of economic impact further upstream. So a fire funding fix that is a fraction of that cost, plus some management reforms that are basically just better policy, is a small price to pay for having this massive impact on the economy, rural jobs and outdoor economy jobs.

Senator BARRASSO. I want to go to Mr. Fite next, but I am going to let you finish it off, Ms. Crowder, and you can talk about that, even things like the eclipse and the impact on people coming to Wyoming, and whether they are going to have a good vision of the Great American Eclipse.

Mr. Fite, let me just get to you in terms of wildlife and the specifics there to better protect species. This Committee has examined how to improve wildlife conservation. We have done that over the last several months; we have had hearings. Given the importance of conservation to this Committee, can you talk a little bit about your thoughts as to the devastating impact wildfires have on our Country's wildlife and how you believe these bills addressed will really help protecting wildlife?

Mr. FITE. Yes, Senator, absolutely. We have seen fires in the West recently that have had dramatic and horrific impacts on key wildlife habitat. One example was a fire complex called Westside on the Klamath National Forest in northern California. It destroyed 20,000 acres of very high quality northern spotted owl habitat. Just destroyed it. It looked like a bomb had gone off, basically. And the Forest Service, in its evaluations of the northwest forest plan 20 years on, it noted that wildfire impacts to key wildlife habitat are 10 times that of timber harvests or really any other impact. Wildfire is really the No. 1 threat that a lot of these sensitive, endangered, and threatened species are facing, particularly forest-dependent species and particularly old forest-dependent species. If we are not managing areas that are designated for timber production or more of the front country, if we are not managing that, then areas that are set aside as reserves are going to be vulnerable from fire.

So we are not looking at management as a solution. It protects not only the active working forests, but it protects areas that we have set aside, such as Glacier. And the solutions that are in front

of this Committee can really have a positive impact on those conservation efforts. Going back to the Cottonwood bill, so many of those projects have significant wildlife benefits like fish passage improvements and the like.

So what the opportunity here is a great win-win of improving wildlife conservation and supporting our local economies, and also preventing more catastrophic wildfire in the future.

Senator BARRASSO. Ms. Crowder.

Ms. CROWDER. Senator, tourism is Wyoming's No. 3 industry. We have several of these reserve forests and wilderness areas and national parks that people enjoy visiting. We have several places throughout State that people love to go fish, they love to go hike, they love to get on the Snake River and raft. What we see from wildfires are concerns from our tourists, as well as our citizens, that they won't be able to do those things that they really want to do.

We often see letters from people who have planned their once-in-a-lifetime trip to Yellowstone, Grand Teton National Park, the Bridger-Teton National Forest, and they find out that there are wildfires and they don't know if they should come to Wyoming or not; they don't know if they should cancel their trip. They are worried about their health; they are worried about their ability to do the activities that they have planned a lifetime for. And that is concerning. And we saw that play out with the Great American Eclipse. And we are not the only State that had these concerns.

The potential for people to come to Wyoming to watch the eclipse in its totality, what an amazing experience, really; and people planned for years for that. And what we saw was a concern and a real concern that wildfires would put a lot of smoke in the air and really block that view, and that would have a major impact on our tourism industry not just for that day, but in the weeks surrounding it. And, luckily, that ended up not being the case, but there were fire bans throughout the State to make sure that would not be the case.

It has also come to light in places like Jackson or Casper, where folks are concerned that wildfires really will ruin their industry, people who live and work in those places who maybe run a fishing business and a guide business or a rafting business. And those folks have concerns that they won't be able to continue their livelihood in these areas if wildfires continue to be an issue and they stop people from coming to these great places that we love across our Nation.

Thank you.

Senator BARRASSO. Well, I appreciate all of you being here. I thought it was excellent testimony; excellent give and take. We had about 10 members who had the chance to be here to ask questions. Some members may want to submit written questions, as well, so I would hope that you would respond to those quickly because the record will stay open for 2 weeks.

I want to thank each and every one of you for being here for this very important issue.

This hearing is adjourned. Thank you.

[Whereupon, at 11:45 a.m. the committee was adjourned.]

○