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RE: Stanislaus Forest Over-Snow-Plan for Snowmobile Use

Due to the change in climate with increasingly elevated snowline, the forests have sustained changes in wildlife habitat and range. Sitings of significant rare wildlife have alerted scientists to the importance of critical areas for habitat and forage in remote forests often adjacent to designated protected areas.

Today, the request to expand areas of travel adjacent to those protected areas, has triggered an alarm for conservationists and wildlife recreationists who value these terrains and the wildlife within these requested, new open spaces. The requests received today signify the problems resulting from the lessening snowfall and increased snow elevations due to the dramatic changes in climate throughout the Sierra Nevada and Cascade Range.

Opening new areas at highest elevations will require expensive maintenance and oversight which will be difficult to provide under stressed budgets. The damage to terrains and wildlife from vehicle traffic cannot be mitigated nor can we recover those species which sustain the greatest impacts.

At this time, I recommend a moratorium on expansion for this current season 2015-2016. For areas adjacent to designated Wilderness, I am opposed to any increase in vehicle traffic and trust that the Forest Service will abide by the laws of conservation of our public lands and wildlife, for the best interest of the the majority of the community at large.

These comments include an attachment with relevant information on the Sierra Frogs. I have a particular interest in protection of the Sierra Nevada Yellow Legged Frog, a fragile species which are highly susceptible to toxins in the air resulting from vehicle emissions.

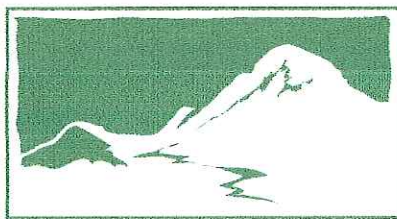
Our community trusts that the right decisions will be made for the best interest of the forest resources. Thank you for allowing this comment.

Attachment: State of Sierra Frogs, www.sierranevadaalliance.org: pgs., 3,4,17,20

State of Sierra Frogs

***A report on the status of frogs & toads in the
Sierra Nevada & California Cascade Mountains***

By Marion Gee, Sara Stansfield, & Joan Clayburgh



SIERRA NEVADA ALLIANCE

Keeping light in the range.

July 2008

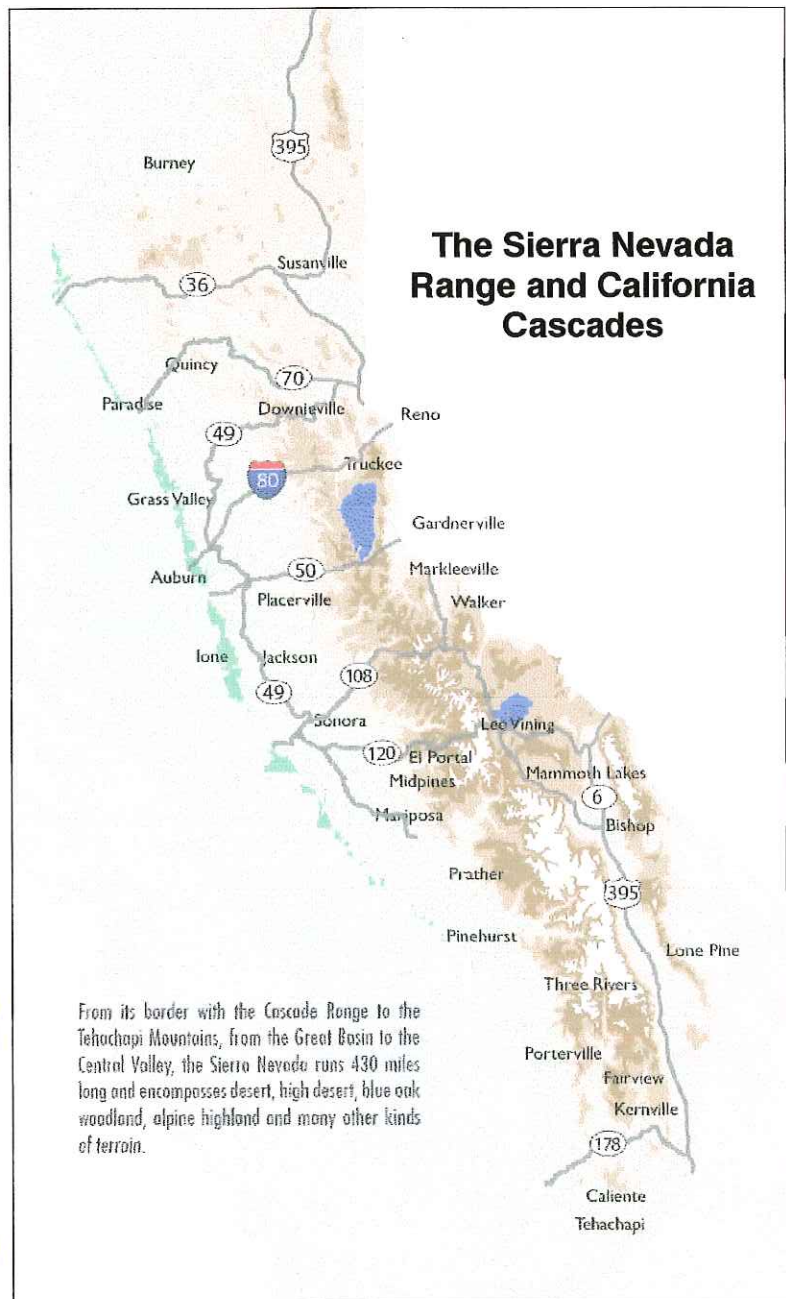
www.sierranevadaalliance.org

Chapter One: Introduction

Sixty five million years after surviving the last great extinction, amphibians continue to live in extreme locations, from deserts to high mountain slopes, a testament to their resiliency and adaptability. Despite thriving for millions of years under a wide range of conditions, the end of the twentieth century saw an alarming rate of amphibian decline: 9 out of 34 known extinctions occurred in the past twenty years alone. In 2006, the Global Amphibian Assessment found that more than 40 percent of the world's 6000 labeled amphibian species have experienced recent declines and nearly a third are threatened with extinction.¹ According to Amphibian Ark Program Officer Kevin Zippel, "the world hasn't seen an extinction crisis like this since the dinosaurs died out."² In this climate of crisis, 2008 was named the Year of the Frog by the Amphibian Ark to raise awareness and promote action.

While not all species are declining, a disconcerting number of frogs are rapidly disappearing from around the world. In the Sierra Nevada and Cascade Range in California, dramatic changes to frog and toad populations are occurring.

For example, the California red-legged frog, the largest native frog in the western U.S., can no longer be found across 70 percent of its historic range in California and has almost completely disappeared from the Sierra foothills.³ Even harder hit is the Sierra Nevada yellow-legged frog population, which, according to the U.S. National Park Service, has disappeared from over 95 percent of its historic habitat.⁴



It is within this context of amphibian population crisis that Professor Carlos Davidson of San Francisco State University teamed up with the Sierra Nevada Alliance in 2003 and applied for

and received funding from the State Water Quality Control Board to study pesticide residues in the bodies of frogs in the California Cascades and Sierra Nevada and the relationship of pesticide residues and frog population declines. This work inspired the Sierra Nevada Alliance to host two public workshops and to write a report on the state of Sierra and California Cascade frogs.

The frogs and toads of the Sierra Nevada and Cascade regions are amazing critters that inspire many of us who enjoy the Sierra with their singing, jumping and antics. The demise of frogs could have further serious implications for ecosystem function, biodiversity and medical studies. We hope this report raises awareness and public concern about the dramatically reduced frog and toad populations of the Sierra and California Cascade ranges.

The Report briefly outlines the value of Sierra and Cascade frogs and toads, provides an overview of individual species experiencing declines, and explains the current stressors to those populations. Finally, the Alliance recommends some potential next steps to address these issues.

The Value of Sierra and Cascade Frogs and Toads

Frogs Play an Important Role in Ecosystem Function and Biodiversity

Throughout their various life stages, frogs and toads play an important role in the function of the ecosystems in which they live. As tadpoles, they help breakdown and cycle nutrients through their aquatic surroundings; without them sediment loads and algae growth increase, subsequently affecting water

quality and aquatic health.⁵

Both tadpoles and adult frogs are an important food

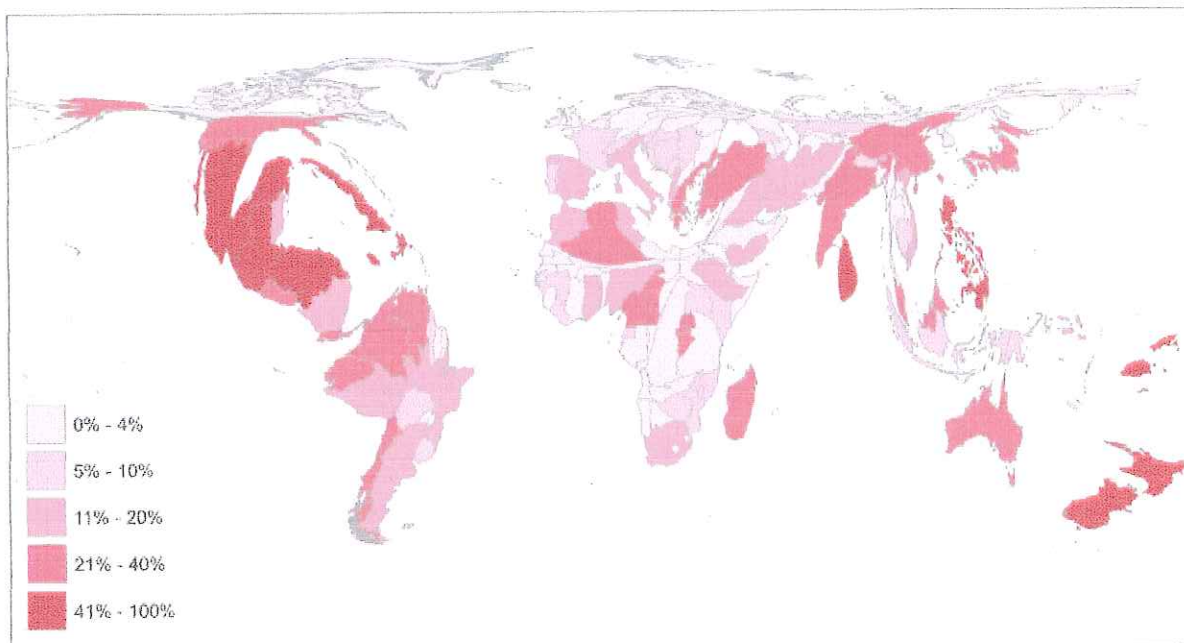
source for predatory birds, snakes and mammals.

Tadpoles and adult frogs are an important food source for predatory birds, snakes and mammals.

Would Sierra ecosystems completely collapse with the disappearance of frogs and toads?

Perhaps not, but as important links like frogs disappear, mammals, birds and fish will reduce in number and combined with other stressors, could eventually go extinct themselves.

Percentage of Threatened and Endangered Species by Country



Map courtesy of Vance Vredenburg, San Francisco State University.

This map shows the percentage of amphibian species in the top three categories of threat, which include: Critically Endangered, Endangered and Threatened.

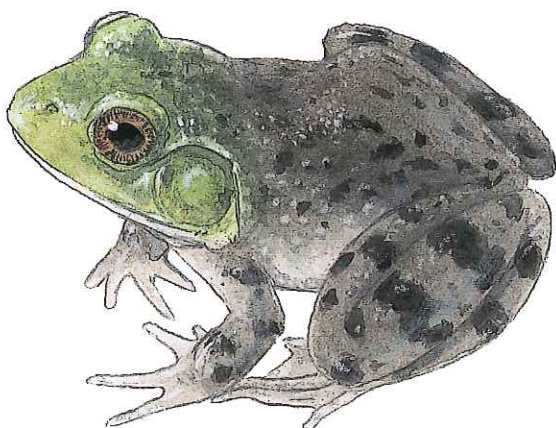


Illustration courtesy of John Muir Laws.

The American bullfrog may be negatively affecting foothill yellow-legged and California red-legged frog populations.

biodiversity in the Sierra. Their large size, vast range and generalized eating practices make it easy for the American bullfrog to adapt. They can live in the wild for eight to ten years and can lay enormous egg masses that contain as many as 20,000 eggs.⁹⁴

Studies done on Sierra frogs showed that bullfrog tadpoles and foothill yellow-legged frog tadpoles compete for food in the larval stage, resulting in a 48 percent reduction in survivorship of foothill yellow-legged frog tadpoles and a 24 percent decrease in their mass at metamorphosis.⁹⁵ A similarly structured study found that bullfrogs have a detrimental effect on California red-legged frogs as well; less than 5 percent of the red-legged frog tadpoles in the presence of bullfrog tadpoles survived.⁹⁶ It remains difficult

Bullfrog tadpoles and foothill yellow-legged frog tadpoles compete for food in the larval stage.

to articulate the exact impact the American bullfrog has

on Sierra frog species decline with so many other factors implicated in their decreasing numbers. However, it is clear they are a significant threat to declining Sierra and Cascade frog populations.

Projects across the world as well as suggestions by researchers, however, could be applied to the Sierra to prevent and contain the further spread of the American bullfrog. In addition, restoring habitat more suitable to native rather than invasive species could also help contain the American bullfrog. Another tool could be the careful management of dams to replicate scouring floods, timing them so as not to interfere

with native frog breeding while also reducing habitat for exotic species like the American bullfrog.⁹⁷ Similarly, livestock grazing, if suitably applied, could maintain vegetation structure that favors native salamanders and red-legged frogs over the American bullfrog.⁹⁸ The Bullfrog Project, run by Dr. Purnima Govindarajulu at the University of Victoria in British Columbia, takes a more comprehensive approach, using public outreach, monitoring and research to prevent bullfrog expansion and to restore native frogs.⁹⁹

Habitat Destruction, Alteration and Fragmentation

Land Use Development Is Destroying and Impairing Frog Habitat

Sierra frogs and toads are particularly sensitive to land use development because their different life stages play out in aquatic, riparian and terrestrial habitats so that changes in any one of those habitats can affect local populations.¹⁰⁰ Habitat can be affected in a number of ways: it can be completely destroyed and lose all biological function; it can be altered so that function is impaired; and, it can be fragmented when isolated patches are no longer linked due to habitat destruction.¹⁰¹ Fragmentation can also indirectly affect Sierra frogs and toads by isolating populations resulting in the loss of genetic diversity over time and reducing frogs' and toads' ability to adapt to changing environmental conditions.¹⁰²

In the continental United States, 91 percent of river lengths were developed by 1988. In the Sierra, two-thirds of riparian habitat is privately owned and developed or at risk of development.¹⁰³ Land use development is increasing as the Sierra is the third fastest growing region in the state and current projections expect a tripling of the Sierra population from 600,000 to between 1.5 and 2.4 million by 2040.¹⁰⁴ It is not just the developed

In the Sierra, two-thirds of riparian habitat is privately owned and developed or at risk of development.

the Sierra foothills below 3,500 feet, red-legged frog habitat is now on private lands, which includes livestock operations.¹²⁸

Not all livestock ponds provide favorable environments for amphibians. Some ponds dry up before the breeding season is over. Other ponds large enough to support wildlife like frogs can also provide habitat for predatory non-native fish and the American bullfrog. Many livestock ponds have also lost their cost-effectiveness and ranchers have allowed them to fill up with sediment or become overgrown.¹²⁹ Similarly, the costs of environmental permits to restore livestock ponds and the fears of regulatory burdens for reporting listed species on their property have pushed ranchers to abandon ponds.¹³⁰



This juvenile California red-legged frog was found in Spivey Pond in El Dorado County.

The re-discovery of red-legged frogs in Calaveras County and a study in the East Bay Regional Park District illustrate that Sierra frog and toad population health and sustainable grazing and ranching may not be mutually exclusive.¹³¹

Climate Change

Climate change is a stressor that Sierra frogs must cope with in addition to a variety of other factors. Climate change impacts such as warming temperatures, reduced snow pack, earlier spring runoff and flooding, increased UV-B exposure and drought are either happening or predicted to happen throughout the Sierra Nevada range.¹³² These changes can have disastrous direct and indirect effects on already stressed Sierra frog and toad species.

Warming temperatures and the earlier advance of spring appear to directly affect amphibian health in a number of ways. Sierra frogs and toads, in comparison with other species, with their permeable skins, unshelled eggs and multiple life stages, may be more sensitive to slight changes in temperature and moisture as a result of climate change.¹³³ Hibernation and breeding in frogs are determined by changes in temperature; frogs and toads that become active earlier and begin breeding are made vulnerable to spring flooding and freezing.¹³⁴ These changes can also cause decreased growth rates, smaller mature frogs and increased mortality in temperate amphibians.¹³⁵ Recently, a field study in the U.K. by C.J. Reading of the Centre for Ecology and Hydrology found the occurrence of milder winters resulted in a reduction in female body size and fertility.¹³⁶

In addition, climate changes can be more favorable to some parasites and disease. There is currently much scientific debate on whether climate change is responsible for creating the conditions that have allowed chytrid to spread and thrive.¹³⁷

For more on climate change impacts in the Sierra Nevada, read the Sierra Nevada Alliance's Sierra Climate Change Toolkit, available for free at www.sierranevadaalliance.org.

Photo courtesy of Elena Delacy, American Rivers Conservancy.