

**Nationwide Aerial Application of Fire
Retardant on National Forest System Land
Biological Assessment for Fish and Wildlife
Service Species**

11 March 2022 Addendum

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This addendum addresses species for which there was a change in status, or additions to the listed species occurring since the previous addendum, completed on 6 December 2021.

This addendum includes the following species that are newly listed or that have had status changes:

- foothill yellow-legged frog (*Rana boylei*) South Sierra, South Coast, and North Feather distinct population segments
- Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*)
- Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*)
- Hermes copper butterfly (*Lycaena hermes*)
- Morro shoulderband snail (*Helminthoglypta walkeriana*)
- Stephens Kangaroo rat (*Dipodomys stephensi*)
- gray wolf (*Canis lupus*)
- western fanshell (*Cyprogenia aberti*)
- Ouchita fanshell (*Cyprogenia cf. aberti*), and
- round ebonyshell (*Reginaia rotulata*)

Several species for which consultation was already completed have undergone official name changes. Those name changes are not addressed here, but the updated official names have been added to the species list in the project record.

This addendum follows the same organization and species groupings used in the 15 November 2021 Biological Assessment. Section numbering, headings, and table numbers below correspond to sections and table numbers for the appropriate species groupings in the Biological Assessment. Discussions for each species adhere to the format in the Biological Assessment.

5.4.5.2 Amphibians: Salamanders, Toads, and Frogs

Frogs and Toads

Table 15. Summary of determinations for frog and toad species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Rana boylei</i>	Foothill yellow-legged frog	PE, PT	na	LAA

¹T= Threatened, E=Endangered, XN= Nonessential Experimental, CH = designated Critical Habitat. ‘P’ preceding any of those indicates species or critical habitat is proposed for listing or designation, but a final rule has not been issued. Parentheses around CH indicates that critical habitat has been designated but is not on National Forest System lands.

² NE= No Effect; NLAA= May Affect, Not Likely to Adversely Affect; LAA= May Affect, Likely to Adversely Affect; NLJ= Not Likely to Jeopardize the continued existence of the species (applies only to non-essential, experimental populations)

Foothill yellow-legged frog- *Rana boylei*

On 22 December 2022 the South Sierra and South Coast Distinct Population Segments of foothill yellow-legged frog were proposed to be listed as endangered, while the North Feather Distinct Population

Segment was proposed to be listed as threatened (86 FR 73914). The Fish and Wildlife Service indicated that designation of critical habitat is not determinable at this time. This species is declining apparently due to habitat alteration, impacts of airborne agrochemicals, and/or competition and predation by exotic species. The ability of this species to recolonize formerly occupied areas may be greatly restricted by current distribution and local extirpation patterns (NatureServe 2022).

The foothill yellow-legged frog is found from the upper reaches of the Willamette River system, Oregon south to the upper San Gabriel River, Los Angeles County, California, including the coast ranges and Sierra Nevada foothills. (NatureServe 2022). The South Sierra Distinct Population Segment occurs on the Sierra, Sequoia, Stanislaus, Eldorado, and Tahoe National Forests. The South Coast Distinct Population Segment occurs on the Los Padres National Forest. The North Feather Distinct Population Segment occurs on the Plumas National Forest. These forests all have high retardant application potential.

Foothill yellow-legged frogs occur in at elevations of 100 to 3280 feet in partly shaded streams in areas of chaparral, open woodland, and forest. They prefer small perennial streams with some cobble-sized rocks, riffle areas, and depths rarely greater than 3.3 feet, but also use intermittent, small rocky streams with seasonal riffle habitat or larger perennial streams with rocky or bedrock habitat. They may also use open perennial streams with little or no rocky habitat but those are less preferred. Breeding occurs streams where eggs are usually attached to gravel or rocks at pool or stream edges. When startled this species seeks cover at the bottom of a pool (NatureServe 2022).

The Distinct Population Segments of foothill yellow-legged-frog occur in limited numbers on seven separate units. Adults are rarely found far from water and tadpoles are unable to avoid retardant if it enters the water when they are present (wildlife screen 2, Figure 11). Any retardant entering the aquatic habitat has the potential to impact individuals. Therefore, **aerial application of fire retardant may affect and is likely to adversely affect the South Sierra, South Coast, and North Feather Distinct Population Segments of foothill yellow-legged frog.** In order to reduce the potential of retardant entering the waterway, *avoidance areas for foothill yellow-legged-frogs have been extended to 600-feet from the edge of the waterway.*

5.4.5.3 Birds

Woodland and Upland Birds

Table 19. Summary of determinations for woodland and upland bird species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Lagopus leucura rainierensis</i>	Mount Rainier white-tailed ptarmigan	PT	na	NLAA

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Mount Rainier white-tailed ptarmigan – *Lagopus leucura rainierensis*

Mount Rainier white-tailed ptarmigan was proposed to be listed as threatened on 15 June 2021 (86 FR 31668). The primary reason for the proposed listing is climate change that will result in loss of suitable alpine vegetation and reduced snow quality and quantity, as well as impacts of rising temperatures on a species that experiences physiological stress at or above 70 degrees Fahrenheit. Connectivity between

populations is low and alpine areas north of the current range of the t Mount Rainier white-tailed ptarmigan are expected to experience similar climate-related impacts. Therefore, it is unlikely that this species can compensate for habitat losses through a northward range shift. The Fish and Wildlife Service determined that designation of critical habitat for this subspecies is not prudent.

Mount Rainier white-tailed ptarmigan are found on the Mount Baker-Snoqualmie National Forest, which does not use retardant, on the Gifford Pinchot National Forest, which has low retardant application potential, and the Okanogan-Wenatchee National Forest, which has high retardant application potential.

Breeding and brood-rearing habitat of the Mount Rainier white-tailed ptarmigan is within the alpine zone, defined by treeline at its lower elevation limit and permanent snow or barren rock at its upper elevation limit. Characteristics of breeding season habitat, based on information from similar subspecies, include areas with forb, grass, sedge and shrub cover; proximity to water; with boulder and shrub cover with islands of trees. Nest site characteristics have not been described for Mount Rainier white-tailed ptarmigan, but other subspecies of white-tailed ptarmigan construct nests in rocky areas, meadows, willow thickets, and in the krummholz zone. Females select nest locations with an abundance of insects, especially leafhoppers (*Cicadellidae*), to meet the food requirements of their chicks (USDI Fish and Wildlife Service 2021).

Mount Rainier white-tailed ptarmigans occur in alpine habitat where retardant use is limited, on forests where the combined retardant use does not impact more than 0.01 percent of the total land base (National Effects Screen Table 13). This species is relatively mobile (Wildlife Screen 2, figure 11), with short term to long term disturbance effects across its range (Wildlife Screen 3, figure 12), and no identified risks from ingestion (Auxilio Management Services 2021; Wildlife Screen 4, figure 13). Based on the limited disturbance impacts, aerially applied fire retardant **may affect, but is not likely to adversely affect the proposed threatened Mount Rainier white-tailed ptarmigan.**

5.4.5.4 Invertebrates: Arachnids, Insects, and Terrestrial Mollusks

Butterflies and Skippers

Table 24. Summary of determinations for butterfly and skipper species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Euphydryas anicia cloudcrofti</i>	Sacramento Mountains checkerspot butterfly	PE	na	LAA
<i>Hermelycaena (Lycaena) hermes</i>	Hermes copper butterfly	PT, PCH	LAA	LAA

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Sacramento Mountains checkerspot butterfly – *Euphydryas anicia cloudcrofti*

Sacramento Mountains checkerspot butterfly was proposed to be listed as endangered on 25 January 2022 (87 FR 3739). It is endemic to the Sacramento Mountains of south-central New Mexico where it is found only in high mountain meadows. The Fish and Wildlife Service found that critical habitat cannot be

determined at this time. They are patchily distributed within a 33 square mile area around the Village of Cloudcroft on the Lincoln National Forest (NatureServe 2022). The Lincoln National Forest has moderate retardant application potential.

The Sacramento Mountains checkerspot butterfly inhabits high altitude meadows in the upper-montane and subalpine zone at elevations between 7,800 and 9,000 feet within the Sacramento Mountains, which are an isolated mountain range in south-central New Mexico. The main larval host plant for the Sacramento Mountains checkerspot butterfly is the New Mexico beardtongue (*Penstemon neomexicanus*). Orange sneezeweed (*Helenium hoopesii*) is the preferred nectar source for adults. The flight season lasts from mid-June to the end of August, but the exact timing of adult flight can vary dramatically from one year to the next (USDI Fish and Wildlife Service 2022).

Data on the potential toxicity of fire retardants to larvae of sensitive invertebrates are lacking. The best scientific information available in the ecological risk assessment (Auxilio Management Services 2021) indicates risk to aquatic invertebrates in some situations. Aerial retardant drops could potentially have direct effects through mortality of adults, larvae, and pupae of the Sacramento Mountains checkerspot butterfly if the retardant covered an individual. Refer to the *Effects Common to All Invertebrates* section beginning on page 87 of the Biological Assessment.

Because of the moderate application potential of retardant where this species occurs, the potential effects to individuals, and the limited range of this species (wildlife screen2, figure 11), aerially applied fire retardant **may affect and is likely to adversely affect Sacramento Mountains checkerspot butterfly**.

This species occurs in close proximity to the town of Cloudcroft, New Mexico. Implementation of avoidance areas to protect the species habitat is being considered, along with other mitigations.

Hermes copper butterfly – *Lycaena hermes*

Hermes copper butterfly (*Lycaena hermes*) was listed as threatened with designation of critical habitat on 21 December 2021 (86 FR 72394). In the Biological Assessment this species was identified as proposed threatened with proposed critical habitat. There are no changes to the critical habitat physical and biological features identified as essential to the conservation of the Hermes copper butterfly as a result of the listing and critical habitat designation. The only change between the proposed and final rule is a slight reduction in the size of critical habitat Unit 3, which includes some land on the Cleveland National Forest. This Unit was reduced by 184 acres to 27,525 acres, of which 10,411 acres is managed by the Fish and Wildlife Service, Forest Service, and Bureau of Land Management. The change in status and slight change in acres does not alter the effects discussion or determinations in the Biological Assessment.

Terrestrial Gastropod

Table 1. Summary of determinations for terrestrial gastropod species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Helminthoglypta walkeriana</i>	Morro shoulderband (banded dune) snail	T, (CH)	na	LAA

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Morro shoulderband (banded dune) snail – *Helminthoglypta walkeriana*

The Morro shoulderband dune snail was listed as endangered on 15 December 1994 (59 FR 64613) and was reclassified to threatened 3 February 2022 (87 FR 6063). The reclassification does not alter the effects discussion or determinations in the Biological Assessment.

5.4.5.5 Mammals

Small Rodents – Mice and Kangaroo Rats

Table 2. Summary of determinations for mouse and kangaroo rat species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Dipodomys stephensi</i>	Stephens' kangaroo rat	T	na	NLAA

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Stephens' kangaroo rat – *Dipodomys stephensi*

The Stephen's kangaroo rat was listed as endangered on 30 September 1988 (53 FR 38465) and was reclassified as threatened 3 February 2022 (87 FR 6063). The reclassification does not alter the effects discussion or determinations in the Biological Assessment.

Carnivores

Table 29. Summary of determinations for Carnivore species

Scientific Name	Common Name	Status ¹	Critical Habitat Determination ²	Species Determination ²
<i>Canis lupus</i>	Gray wolf	E, CH	NE	NLAA

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Gray Wolf - *Canis lupus*

A 10 February 2022, court decision reinstated Endangered Species Act protections for gray wolves in the contiguous 48 states and Mexico, with the exception of the Northern Rocky Mountains population. Gray wolves are listed as threatened in Minnesota, and endangered in the remaining states where the ruling applies. Critical habitat for gray wolves in Minnesota and Michigan was also reinstated by the ruling. The gray wolf is threatened by direct human-caused mortality and possibly habitat loss (NatureServe 2022). According to the Fish and Wildlife Information for Planning and Consultation (iPaC) system, wolves are listed as endangered on the following forests and retardant application potential is indicated for each:

- no retardant use - Mt. Baker-Snoqualmie, Ottawa, and Hiawatha National Forests
- very low retardant application potential - Columbia River Gorge
- low retardant application potential – Gifford Pinchot National Forest

- moderate retardant application potential – Fremont-Winema, Umpqua, and Umatilla National Forests
- high retardant application potential – Okanogan-Wenatchee, Deschutes, Ochoco, Rogue River, Malheur, Wallowa-Whitman, Six Rivers, Klamath, Modoc, and Shasta-Trinity National Forests.

Gray wolves are listed as threatened, with critical habitat, on the Chippewa and Superior National Forests, both of which have very low retardant application potential.

Gray wolf are habitat generalists found where human population density and human-caused mortalities are low and prey densities are high. Ungulates are the predominant prey, but alternate prey such as beaver, hare, rodents and carrion are also important. Wolves are highly social, usually existing in packs in which only the dominant pair reproduce. Young are born in dens from March through early April. Parents and young leave the den area when the pups are about 3 months old, although non-breeding pack members may continue to use the entire home range or territory during the breeding and pup-rearing period. Home ranges in the conterminous United States have been found to be as large as 215 to 300 square miles (NatureServe 2021).

The **Effects Analysis and Determinations for Carnivore Species** describes the effects for carnivores, including those to gray wolf, on page 128 of the Biological Assessment. Based on that discussion, aerially applied retardant **may affect but is not likely to adversely affect gray wolf**.

5.5.4.2 Species Discussions

Bivalves (mussels)

Aerially applied retardant was found to have No Effect on the newly listed Ouachita fanshell (*Cyprogenia* cf. *aberti*) and round ebonyshell (*Reginaia rotulata*) or their designated critical habitats.

Table 34. Summary of determinations for bivalve species and critical habitats

Scientific Name	Common Name	Status	Critical Habitat Determination	Species Determination
<i>Cyprogenia aberti</i>	Western fanshell	PT, PCH	NLAA	NLAA

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Western Fanshell – *Cyprogenia aberti*

Western fanshell was proposed to be listed as threatened, with critical habitat, on 3 March 2022 (87 FR 12338). This species is currently found in the Lower Mississippi-St. Francis, Neosho-Verdigris, and Upper White River basins, within the States of Arkansas, Kansas, Missouri, and Oklahoma. It is considered extirpated from the Lower Arkansas basin. Water quality degradation, altered flow, landscape changes, and habitat fragmentation, all of which are exacerbated by the effects of climate change, are the primary threats affecting the western fanshell. The species is found in the Upper Black River and St. Francis River on the Mark Twain National Forest, which has very low retardant application potential.

The western fanshell is typically found in large creeks and rivers with good water quality, moderate to swift current, and gravel-sand substrates, but specific information on microhabitat requirements is lacking. Like all mussels, this species primarily filter-feeds on a wide variety of microscopic particulate

matter suspended in the water column, including phytoplankton, zooplankton, bacteria, detritus, and dissolved organic matter (87 FR 12338). As with most freshwater mussels, the fanshell mussels have a life cycle that relies on fish hosts for successful reproduction. Suitable fish hosts include logperch (*Percina caprodes*), orangebelly darter (*Etheostoma radiosum*), slenderhead darter (*Percina phoxocephala*), fantail darter (*Etheostoma flabellare*), and rainbow darter (*Etheostoma caeruleum*) (87 FR 12338).

Proposed critical habitat occurs on the Mark Twain National Forest. The following physical or biological features are essential to the conservation of the western fanshell:

- (1) Adequate flows, or a hydrologic flow regime, necessary to maintain benthic habitats where the species are found and to maintain stream connectivity, specifically providing for the exchange of nutrients and sediment for maintenance of the mussels' and fish hosts' habitat and food availability, maintenance of spawning habitat for native host fishes, and the ability for newly transformed juveniles to settle and become established in their habitats. Adequate flows ensure delivery of oxygen, enable reproduction, deliver food to filter-feeding mussels, and reduce contaminants and fine sediments from interstitial spaces.
- (2) Suitable substrates and connected instream habitats, characterized by geomorphically stable stream channels and banks with habitats that support a diversity of freshwater mussel and native fish.
- (3) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages, including, but not limited to: Dissolved oxygen (generally above 3 parts per million) and water temperature (generally below 80 degrees Fahrenheit). Additionally, water and sediment should be low in ammonia (generally below 1.0 ppm total ammonia-nitrogen) and heavy metals, and lack excessive total suspended solids and other pollutants.
- (4) The presence and abundance of fish hosts necessary for recruitment of the western fanshell, including logperch, rainbow darter, slenderhead darter, fantail darter, or orangebelly darter.

Because of the expanded avoidance areas used by the Mark Twain National Forest, and the generally discountable effects (refer to the section on effects common to all bivalves and their critical habitat on page 153 of the Biological Assessment), use of aerially delivered retardant **may affect, but is not likely to adversely affect western fanshell and its proposed critical habitat.**

Literature Cited

- Auxilio Management Services, 2021. Ecological Risk Assessment of Wildland Fire-Fighting Chemicals: Long-Term Fire Retardants (non-confidential summary). Prepared for Fire and Aviation Management & National Technology and Development Program, USDA Forest Service, Missoula, MT. June 2021. Auxilio Management Services, Denver, CO. 86 pages.
- NatureServe. 2022. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/> (Accessed: February through March 2022).