



United States Department of Agriculture

**TERRESTRIAL AND AQUATIC WILDLIFE  
BIOLOGICAL EVALUATION  
FOR  
NATIONWIDE AERIAL APPLICATION  
OF FIRE RETARDANT  
ON NATIONAL FOREST SYSTEM LANDS  
USDA FOREST SERVICE WASHINGTON  
OFFICE**

Prepared By: Katherine Malengo  
Wildlife Biologist  
Forest Service Enterprise Program

Reviewed By: David A. Austin  
Forest Biologist  
San Bernardino National Forest

Reviewed By: Laura Conway  
Natural Resource Specialist  
Fire and Aviation Management

# Contents

|  |    |
|--|----|
| Introduction .....   | 4  |
| Background .....   | 4  |
| Project Description .....  | 4  |
| Proposed Action (Modified Alternative 3).....                                    | 4  |
| Aircraft Operational Guidance .....  | 5  |
| Avoidance Areas Mapping Requirements.....  | 6  |
| Annual Coordination .....  | 7  |
| Reporting Requirements.....  | 7  |
| Consultation Procedures for Additions to the Qualified Products List .....       | 7  |
| Analysis Methodology .....   | 8  |
| National Effects Screening Process.....  | 9  |
| Information and Assumptions Used in the National Effects Screening Process ..... | 9  |
| National Effects Screens.....  | 10 |
| Terrestrial/Aquatic Species Impact Screens.....                                  | 11 |
| General Assumptions: .....   | 12 |
| Terrestrial Screen 1 (Mobility).....   | 12 |
| Terrestrial Screen 2: Disturbance .....  | 13 |
| Terrestrial Screen 3: Ingestion.....   | 14 |
| Aquatic Screen .....   | 16 |
| Affected Environment .....   | 17 |
| Environmental Consequences .....   | 33 |
| Analysis of Effects Common to All Sensitive Species.....                         | 33 |
| Potential Direct and Indirect Effects Common to All Sensitive Species.....       | 34 |
| Chemical Risks.....  | 34 |
| Other Effects.....   | 39 |
| Potential Cumulative Effects Common to All Sensitive Species .....               | 40 |
| Analysis of Effects by Species Group .....                                       | 40 |
| Puerto Rico Species.....   | 41 |
| Group: Mammals.....  | 41 |
| Group: Birds.....  | 42 |
| Group: Reptiles.....   | 44 |
| Group: Amphibians .....  | 45 |
| Group: Invertebrates.....  | 45 |
| Group: Fish.....   | 48 |
| Summary of Determinations.....   | 48 |

|   |    |
|---|----|
| References Cited.....                                       | 49 |
| Appendix A: Regional Forester Sensitive Species Lists ..... | 51 |
| Appendix B: Retardant Application Potential .....           | 77 |
| Appendix C: Intrusion Data (2012 – 2019).....               | 82 |
| Appendix D: Species Determinations by Unit .....            | 83 |

**List of Tables**

|  |    |
|--|----|
| Table 1: National impacts screening process for sensitive wildlife species.....                  | 10 |
| Table 2: Representative ecoregions for retardant application .....                               | 19 |
| Table 3: Fire and retardant use information by region and forest, 2012 through 2019 .....        | 21 |
| Table 4: Component amounts of fire retardants currently on the Qualified Products List.....      | 32 |
| Table 5: Product toxicity risk summary, by application rate, for terrestrial species .....       | 36 |
| Table 6: Estimated risks to aquatic species from accidental application of mixed retardant ..... | 37 |

**List of Figures**

|  |    |
|--|----|
| Figure 1. Terrestrial Screen 1: Mobility .....   | 13 |
| Figure 2. Terrestrial Screen 2: Disturbance..... | 14 |
| Figure 3. Terrestrial Screen 3: Ingestion .....  | 15 |

## Introduction

The purpose of this biological evaluation is to analyze the extent to which implementation of the proposed action (implementation of the nationwide aerial retardant program, as described in the 'Project Description' section of this document) may affect any terrestrial and aquatic Regional Forester Sensitive Species (i.e., "sensitive species"). Forest Service Manual 2670 direction requires preparation of a biological evaluation for all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on threatened, endangered, proposed, candidate for listing, or sensitive species. Biological assessments have been prepared separately to address threatened, endangered, proposed and candidate species, and consultation under the Endangered Species Act Section 7 has occurred. This report addresses the potential effects of the proposed action on terrestrial and aquatic wildlife sensitive species. Plant species are evaluated in a separate Biological Evaluation.

## Background

In October of 2011, the Forest Service signed the Record of Decision for the Nationwide Aerial Application of Fire Retardant on National Forest System Land (United States Department of Agriculture Forest Service 2011d). Endangered Species Act consultations associated with that decision covered a ten-year timeframe. In preparation for reinitiating consultation prior to the expiration, the Forest Service reviewed the Final Environmental Impact Statement (USDA Forest Service 2011a) for new information or changed conditions. The results are documented in a supplemental information report (USDA Forest Service 2020a). Based on recommendations in the supplemental information report, the Forest Service is completing a Supplemental Environmental Impact Statement to analyze a modified proposed action, updating consultations, and updating analyses of impacts to sensitive species.

## Project Description

The U.S. Department of Agriculture, Forest Service, proposes to continue the nationwide use of aerial application of fire retardant. Effects described within this biological evaluation refer to aerial delivery of retardant only. This analysis does not address use of foams, water enhancers, ground-based application of retardants, or the environmental effects of wildland fire. Aerial use of fire retardant is a programmatic activity with no end date.

## Proposed Action (Modified Alternative 3)

This alternative would allow aerially applied fire retardants, included now or in the future on the Forest Service Qualified Products List, to be used on NFS lands as follows:

- Aerial retardant drops would be prohibited in aerial retardant avoidance areas (see definition below), which include:
  - ◆ Waterways or their buffers, whether mapped or not, when water is present (also referred to as aquatic avoidance areas).
  - ◆ All or part of the habitat of certain Endangered Species Act threatened, endangered, proposed, or candidate species or Regional Forester sensitive species, as mapped per

the requirements described in the “Aerial Retardant Avoidance Areas Mapping Requirements” section of this alternative.

- ◆ Areas mapped by the local unit.
- The above direction would be mandatory nationwide except when human life or public safety are threatened and retardant use in the aerial retardant avoidance area could be reasonably expected to alleviate that threat.
- When an intrusion (formerly termed ‘misapplication’; see definition below) occurs for any reason it would be reported, and if necessary it would be assessed for impacts, monitored, and remediated.

The definition of ‘aerial retardant avoidance area’ has been updated to clarify its purpose and ensure consistency in use. An aerial retardant avoidance area (also referred to simply as ‘avoidance area’) is defined as *an area in which application of aerial fire retardant is prohibited in order to avoid, limit, or mitigate potential impacts to specified resources.*

- The term ‘aquatic avoidance area’ refers to any avoidance area, whether mapped or not, that is based on the presence of water, or as mapped to reduce impacts to Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat associated with waterways, waterbodies, or riparian areas.
- The term ‘terrestrial avoidance area’ refers to any avoidance area that is mapped to protect Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat or other resources that are not associated with waterways or riparian areas.

The term ‘misapplication’ has been replaced by the term ‘intrusion’ for clarity of meaning. An intrusion is defined as *the intentional or unintentional application of aerial fire retardant into an aerial retardant avoidance area.*

The term ‘waterway’ in this context includes but is not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, peatlands, and riparian vegetation.

In addition to the above direction, this alternative includes five components that provide specific direction for aircraft operations, aerial retardant avoidance area mapping, coordination, reporting and monitoring, and procedures for additions to the Qualified Products List, as described below. Additional information on implementation of these components, as well as guidance on operations planning and on the role and function of resource specialists are found in the [Implementation Guide for Aerial Application of Fire Retardant](#) (USDA 2019 or subsequent versions).

## **Aircraft Operational Guidance**

This guidance shall not require pilots to fly in a manner that endangers their aircraft or other aircraft or structures, or that compromises the safety of ground personnel or the public.

*Operational guidance to ensure retardant drops are not made within avoidance areas:*

Incident commanders and pilots should follow guidance in the current version of the [Implementation Guide for Aerial Application of Fire Retardant](#) (USDA 2019 or subsequent versions), which will be updated as needed. This guidance includes:

- Requirements for providing pilots with maps or other information about the location of all avoidance areas on the unit.
- Information on performing dry runs or other methods for ensuring retardant is not applied in avoidance areas.
- Information on when and how to terminate and resume application of fire retardant when approaching and departing avoidance areas.
- Guidance on flight conditions that allow for safe and effective use of retardant, including keeping retardant out of avoidance areas.

*Operational guidance to limit potential impacts outside of avoidance areas to species listed under the Endangered Species Act or to Regional Forester Sensitive species:*

Whenever practical, agency administrators and incident commanders should use water or other less toxic suppressants in habitats of species listed under the Endangered Species Act or certain Regional Forester sensitive species, where those habitats are not mapped as avoidance areas.

*Operational guidance to provide protection of cultural resources, including historic properties, traditional cultural resources, and sacred sites:*

These resources cannot be mapped using a national protocol or addressed with a standard prescription that would apply to all instances. Cultural resources specialists, archaeologists, and tribal liaisons would assist on a case-by-case basis in the consideration of effects and alternatives for protection when aerial application of fire retardant is ordered. Incident commanders would consider the effects of aerial applications on known or suspected historic properties, any identified traditional cultural resources, and sacred sites.

## **Avoidance Areas Mapping Requirements**

All forests and grasslands would review and update maps annually, following current national mapping protocols described in the [Implementation Guide for Aerial Application of Fire Retardant](#) (USDA 2019 or subsequent versions).

Requirements for mapping or identifying aerial retardant avoidance areas are as follows:

- Any waterway (including but not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, peatlands, and riparian vegetation) in which water is present at the time of retardant application, and buffers extending no less than 300 feet on either side of a waterway, is considered an avoidance area (also called aquatic avoidance area), whether mapped or not.
- Mapping of waterways that are dry at the time of retardant application is not required.
- Map avoidance areas where aerial application of fire retardant may impact one or more aquatic or terrestrial Endangered Species Act threatened, endangered, proposed, or candidate plant or animal species or designated critical habitat, as identified in consultations.

- Map avoidance areas where aerial application of fire retardant may impact certain aquatic or terrestrial Regional Forester sensitive species or their habitat.
- Avoidance areas may be adjusted or established based on local conditions, including to comply with forest plan requirements such as those for Species of Conservation Concern or to protect other biological or cultural resources. Avoidance area buffers around waterways may not be less than 300 feet on either side of a waterway in which water is present but may be increased where needed. Adjustments related to Endangered Species Act threatened, endangered, proposed, and candidate species would be coordinated with the United States Department of Interior Fish and Wildlife Service (Fish and Wildlife Service) and the United States Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries).
- Consult with local tribes to identify any avoidance areas needed to protect cultural resources or sacred sites.

## Annual Coordination

The Forest Service would coordinate annually with:

- The Fish and Wildlife Service and NOAA Fisheries (collectively, ‘the Services’)
- Aviation managers and pilots
- Cooperators/other agencies

Coordination would ensure that requirements of this alternative are met, and would maintain relationships and allow problem resolution to occur at the lowest management level. Guidance on coordination meetings would be provided in the [Implementation Guide for Aerial Application of Fire Retardant](#) (USDA 2019 or subsequent versions).

## Reporting Requirements

The Forest Service would maintain a database for reporting intrusions of aerially applied fire retardant into avoidance areas. Intrusion reporting requirements are described in the [Implementation Guide for Aerial Application of Fire Retardant](#) (USDA 2019 or subsequent versions), and include requirements for upward reporting to the Services for any intrusions into avoidance areas for any threatened, endangered, proposed, or candidate species or critical habitat. The Forest Service would provide to the Services annual reports summarizing retardant use and intrusions, as described in the Implementation Guide.

If a retardant drop occurs on a cultural resource, a traditional cultural property, or a sacred site, then the site condition would be assessed by a qualified archaeologist and reported to the State Historic Preservation Officer and, if appropriate, tribal representatives including the Tribal Historic Preservation Officer. If the affected resource is a sacred site or a traditional cultural property, then tribal notification and consultation would be required as part of the determination of effects. If the effect is found to be adverse, then the agency would consult with the tribe to determine an appropriate course of action to mitigate or resolve the adverse effect.

## Consultation Procedures for Additions to the Qualified Products List

Private companies submit retardants to the Forest Service for potential addition to the [Qualified Products List](#). New products or new formulations of existing products must meet Forest Service

specifications for long-term retardant (United States Department of Agriculture, Forest Service, [Specification 5100-304 Long-term Retardant](#), Wildland Firefighting) to be included on the Qualified Products List. In addition to meeting those specifications, any retardant added to the Qualified Products List would meet the requirements of the Endangered Species Act as follows:

- Products or new formulations do not require additional consultation as long as the maximum extent and duration of effects of the new products do not exceed the effects of other products already considered in the biological assessments and biological opinions for this action. Products will generally meet these criteria when amount of retardant salts when delivered at standard coverage levels, and the percentage of thickeners, coloring agents, and performance ingredients in the total mixed product do not exceed those established in completed consultations. The toxicity levels of new products must not exceed those of products with completed consultations, and there must be no risk factors risks not previously identified and assessed in completed consultations. The Services will be notified of additions to the Qualified Products List and will be provided appropriate supporting information.
- Products or new formulations that do not meet the above criteria would require re-initiation of consultation with the Services. The product would not be eligible for addition to the Qualified Products List until all required tests and consultations are completed.

In the future, any retardant that is added to the Qualified Products List could be used under the direction provided in this alternative.

## Analysis Methodology

Environmental effects have been analyzed on a nationwide, programmatic scale. Because the analysis is at such a large scale and addresses a nationwide program rather than a specific action (i.e., we cannot predict when, where, in what habitat type, or how large or long-lasting a wildfire event will happen, nor can we predict when, where, or how much aerial fire retardant may be used on a specific wildfire incident), the analysis is generally not quantitative. Details regarding analyses for species groups or individual species or habitats are provided as needed in the appropriate sections below.

The information on amounts of retardant use contained in this analysis is derived from the most accurate available data on aerial application of fire retardant use spanning the years 2012 through 2019. The analysis relies on information and assumptions incorporated into the screening process (see below), avoidance mapping to reduce effects, and known information on use in the past projected into the immediate and near future. The analysis timeframe is 20 years.

The following information sources were used to identify species to be considered and to evaluate environmental consequences at a national scale:

- Lists of Forest Service Regional Forester Sensitive Species by Region and unit, current as of 2019.
- Current Forest Service lists of known and suspected occurrences of species occurring on or near National Forest System lands (refer to each section on wildlife, fish, and plants),
- Species-specific and habitat-specific information including NatureServe information, and other available information regarding species needs, habitats, threats, and other factors influencing potential impacts of aerial retardant use.



- Information in ecological risk assessments and other published information regarding the effects of aerial fire retardants and their components on terrestrial and aquatic wildlife species.

Determinations have been made at the scale of individual units, meaning that if a species occurs on more than one National Forest, it will receive more than one determination. For example, a species may receive a “No Impact” determination on a forest that doesn’t use aerially applied fire retardant, but the same species may receive a “May Impact Individuals and Habitat” determination for occurrences on a forest that uses aerially delivered fire retardant.

## National Effects Screening Process

A two-part impacts screening process has been developed for sensitive species. The first step, a National Effects Screening Process, was developed as a coarse filter for all sensitive species to determine the impacts based on the potential use of aerial application of fire retardant on wildlife, plant, and aquatic species and habitats. The process was developed for the consultation completed in 2011 and updated for use in the current consultation.

### Information and Assumptions Used in the National Effects Screening Process

The occurrence of past fires and retardant drops provide a baseline and indicator for considering when and where retardant may be used in the future. Retardant application potential is described for each unit as ‘very low’, ‘low’, ‘moderate’ or ‘high’ based on the average annual retardant use by forest between 2012 and 2019 and the maximum total gallons of retardant used in any given year from 2012 through 2019 (Table 3). These category assignments may be adjusted for a specific unit based on the percent of National Forest System land on which aerially delivered retardant is used annually, on average, along with the frequency (number of years retardant was used over the 8-year period) of use for that unit. This adjustment takes into consideration that smaller units could experience greater impact if a larger proportion of the land base is affected by retardant annually.

The retardant application potential for each forest is listed in Appendix B. The criterion for the categories is as follows:

- ‘Very low’ retardant application potential:
  - ◆ annual average of less than 25,000 gallons,
  - ◆ maximum of 100,000 gallons,
  - ◆ average aerial retardant used on up to 0.01 of forest unit annually, and
  - ◆ frequency of generally less than 0.375.
- ‘Low’ retardant application potential:
  - ◆ less than 50,000 gallons on average annually,
  - ◆ less than 200,000 gallons maximum,
  - ◆ average aerial retardant used on up to 0.01 of forest unit annually, and
  - ◆ generally less than 0.625 frequency.
- ‘Moderate’ retardant application potential:
  - ◆ less than 150,000 gallons on average annually, and
  - ◆ less than 500,000 gallons maximum,
  - ◆ average aerial retardant used on up to 0.01 of forest unit annually, and

- ◆ generally between 0.5 to 0.8 frequency.
- ‘High’ retardant application potential:
  - ◆ 150,000 gallons on average annually,
  - ◆ greater than 500,000 gallons maximum, average aerial retardant used on more than 0.01 of forest unit annually, and greater than 0.8 frequency.

The national effects screening process also relied on the following assumptions:

- Historical Fire Season Data: The 2012-2019 fire season statistics (Table 3) provide a reasonable representation of the potential for retardant applications on National Forest System lands over the next 20 years.
- Avoidance area designations would protect known species occurrences from adverse impacts by prohibiting retardant use in those areas.
- Intrusions of aerial fire retardant may occur in avoidance areas on rare occasions. Data from intrusion of retardant in terrestrial avoidance areas averaged 0.06 percent of the estimated number of drops (range 0.02 – 0.16 percent) from 2012 through 2019 (Appendix C). Intrusions into water or buffer zones averaged 0.76 percent (range 0.40 – 1.48 percent) across all years. This analysis assumes that intrusion rates will remain similar in the future.
- Past retardant use and intrusion data does not allow for predictions about when or where intrusions may occur in the future. Assuming the potential for an intrusion is higher in areas where more retardant is applied, all species that occur in these areas could be impacted unless other factors (habitats) determine otherwise.
- Under some circumstances, terrestrial wildlife populations that are isolated or rare could be more vulnerable to impacts of aerial fire retardant application, depending on the potential for retardant use where they occur.

## National Effects Screens

Table 1 shows the screens used process to standardize impacts determinations for sensitive terrestrial and aquatic species, respectively, addressed in this analysis. The screens rely on information about species habitat and distribution as well as on the potential for aerial retardant application on the unit where the species occurs and is identified as a Regional Forester sensitive species. As shown in the table, some species may require further screening through the terrestrial or aquatic wildlife species screens, which are discussed below.

**Table 1: National impacts screening process for sensitive wildlife species**

| Aerial Retardant Application Potential | National Screening Factor for Aerially Applied Retardant   | Impact <sup>1</sup> |
|--|--|---------------------|
| none                                   | Species/habitat occur in areas with no fires, therefore no potential retardant use. Examples: cliffs, caves, estuaries, marshes, lakes, ocean shoreline, sand dunes. | NI                  |

| <b>Aerial Retardant Application Potential</b> | <b>National Screening Factor for Aerially Applied Retardant</b>   | <b>Impact<sup>1</sup></b>                    |
|---|---|--|
| none  | Species occurs near, but not on national forest lands and effects from retardant use on forest lands are not anticipated.   | NI   |
| none  | No retardant use recorded on forests where species occur or are suspected   | NI   |
| <b>Aquatic Habitats</b>                       |   |  |
| very low to low                               | Species occurs on forest with very low or low retardant application potential   | MIIH   |
| moderate to high                              | Species occurs on forest with greater than low retardant application potential.   | MIIH or WII: use Aquatic Effects screens     |
| <b>Terrestrial Habitats</b>                   |   |  |
| very low to high                              | Species occurs or is suspected of occurring on a forest with less than 0.01 percent of its land base impacted by retardant on average annually <sup>2</sup> , and retardant is generally not used in species habitat. Examples include desert, dense forest canopy, alpine, talus/scree slopes. | NI   |
| very low to high                              | Species occurs or is suspected of occurring on a forest with <b>less than</b> 0.01 percent of its land base impacted by retardant on average annually <sup>2</sup> , and retardant may be used in species habitat. Species populations are <b>not isolated</b> .                                | MIIH   |
| very low to high                              | Species occurs or is suspected of occurring on a forest with <b>less than</b> 0.01 percent of its land base impacted by retardant on average annually <sup>2</sup> , and retardant may be used in species habitat. Species populations are isolated.  | MIIH or WII: use Terrestrial Effects screens |
| very low to high                              | Species occurs or is suspected of occurring on a forest with <b>greater than</b> 0.01 percent of its land base impacted by retardant on average annually <sup>2</sup> , and retardant is generally not used in species habitat.   | MIIH   |
| very low to high                              | Species occurs or is suspected of occurring on a forest with <b>greater than</b> 0.01 percent of its land base impacted by retardant on average annually <sup>2</sup> , and retardant may be used in species habitat.   | MIIH or WII: use Terrestrial Effects screens |

<sup>1</sup>NI: no impact; MIIH: May impact individuals and habitat – no trend toward listing; WII: Will impact individuals and habitat – trend toward listing

<sup>2</sup>Table 3

## Terrestrial/Aquatic Species Impact Screens

Terrestrial and aquatic wildlife impacts screens were developed as a fine filter to supplement the National Effects Screening Process, to provide a consistent approach when additional consideration is needed, similar to the process used in the Biological Assessment for Fish and Wildlife Service Species (USDA Forest Service 2021c). Where there is uncertainty in determinations after the National Effects Screens were applied, as when the screen leads to an either/or decision, or when additional considerations are warranted, the terrestrial or aquatic screens were used. The terrestrial screens use information on species mobility, potential disturbance to species based on event timing and duration, and potential for ingestion and toxicity based on information in risk assessments. The aquatic screen uses information about species distribution at two scales to help reach a determination of effect.

In addition to the information and assumptions listed for the National Effects Screens above, the following information and assumptions were used in applying the terrestrial and aquatic screens.

### **General Assumptions:**

- The mitigation measures of avoidance mapping for habitat and populations will include established trigger points (at local level) for restricting the use of retardants within watersheds where retardant has caused adverse impacts to a species or population.
- Yearly pre-season coordination meetings will occur and help in reducing impacts to species and habitats by discussing changes in new population information and monitoring needs for species prior to season use.

### **Terrestrial Screen 1 (Mobility)**

Terrestrial screen 1 addresses whether individuals of a species can potentially move away from areas impacted by aerial retardant, in the context of the retardant application potential of national forest units on which they occur. For consistency in applying the screen, home range sizes were considered in relation to the average acreage of individual retardant drops. The following definitions were used to estimate mobility of the individuals of a species:

- Not mobile: Species is small or slow (such as a turtle or caterpillar) and home range is less than ten acres.
- Limited: Individuals are small (such as a ground squirrel) and are capable of moving out of the way of an approaching danger but have small to moderate home ranges (ten to 100 acres) that could be mostly impacted by one or more retardant drops.
- Mobile: Individuals are medium to large in size (such as deer) and relatively large daily movements are common. Individual home ranges are greater than one hundred acres.
- Very mobile: Individuals are medium to large in size and move regularly or rapidly (such as coyote). Individual home ranges are generally larger than 1000 acres.

When using this screen, consideration is given to whether individuals of a mobile or very mobile species are able to avoid aerial retardant based on the timing of retardant use on the national forest units where they occur, and the season or life history stage of that species. For example, nesting birds, young non-volant bats, larval insects, and others may be unable to avoid aerial retardant use that occurs during those seasons or life stages. Where local units deem it necessary, avoidance areas may be mapped to limit potential impacts during those times. Additional assumptions used in this screen include:

- Species with limited mobility whose habitats are included in avoidance areas are less likely to be affected by aerial retardant drops than those whose habitats are not in avoidance areas.
- Burrowing species are likely to take refuge underground during a wildfire and therefore they may also avoid direct exposure to aerial retardant drops.

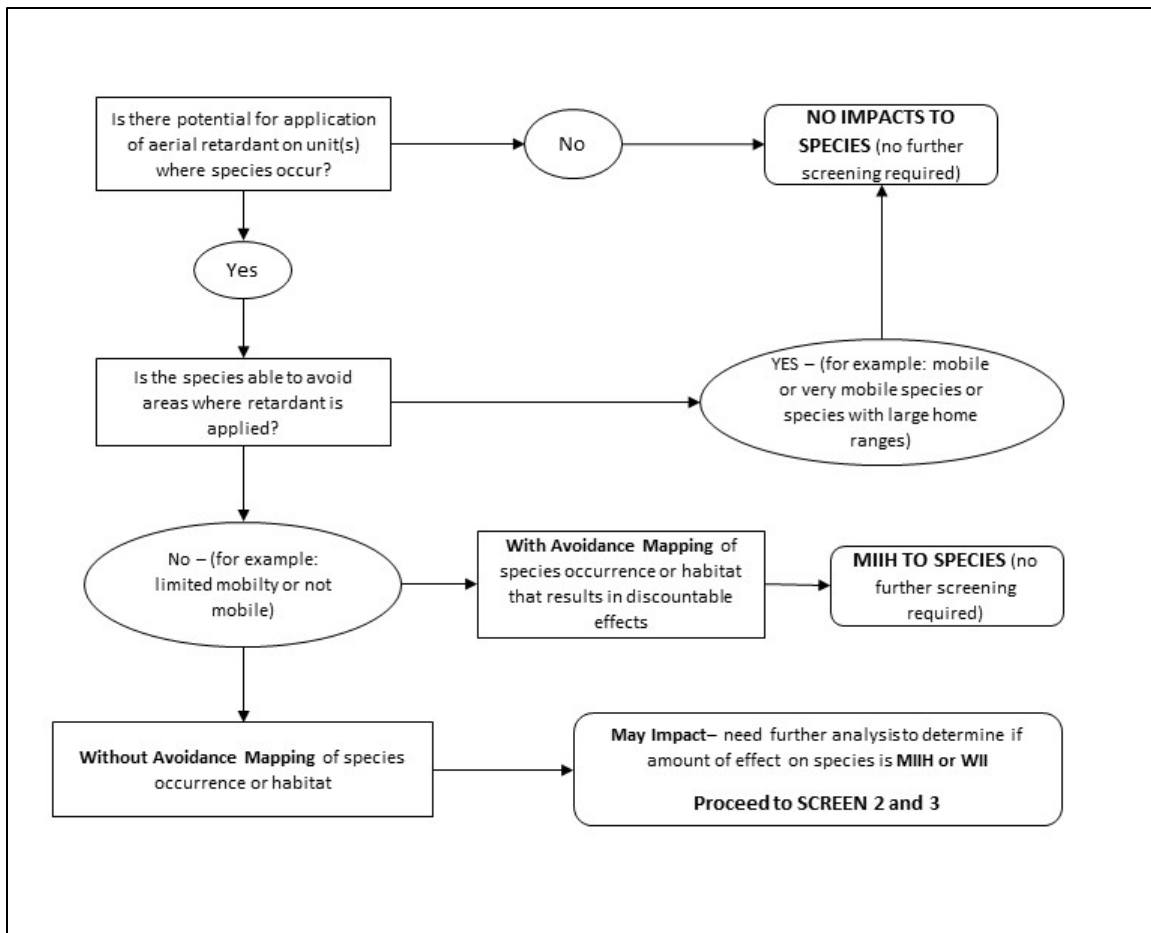


Figure 1. Terrestrial Screen 1: Mobility

## Terrestrial Screen 2: Disturbance

The use of aircraft to deliver fire retardant has the potential to disturb some species due to noise or the visual impact of approaching aircraft or falling retardant. Disturbance can involve at a minimum some expenditure of energy that would not otherwise be used, or may involve movement away from preferred foraging or other habitat, movement away from or abandonment of nests or dens leaving young vulnerable to mortality, displacement of individuals into home ranges of other individuals, or other impacts.

Use of this screen involves the assumption that the effect of potential disturbance is influenced by the duration of the disturbance, and by the timing of when it occurs (i.e., during nesting, denning, or other time periods of critical importance to individuals of the species). Expected timing of aerial retardant use is based on retardant use data gathered since 2000 for each Forest Service Region; that timing is used to determine whether aerial retardant use is likely to occur during a species' critical time period(s).

Disturbance from aircraft is categorized as short-term or long-term. Short-term disturbance is one to three flyovers at altitudes below 500 feet above ground level occurring over a 48-hour period or less. Long-term disturbance is more than three flyovers occurring over a period longer than 48 hours. Duration of disturbance or of a fire incident cannot be predicted in advance. Therefore, this

screen uses retardant application potential as an indicator of the likelihood of short or long-term disturbance as follows:

- Units with very low or low retardant application potential are assumed to primarily experience short-term disturbance.
- Units with moderate or high retardant application potential are assumed to likely experience long-term disturbance.

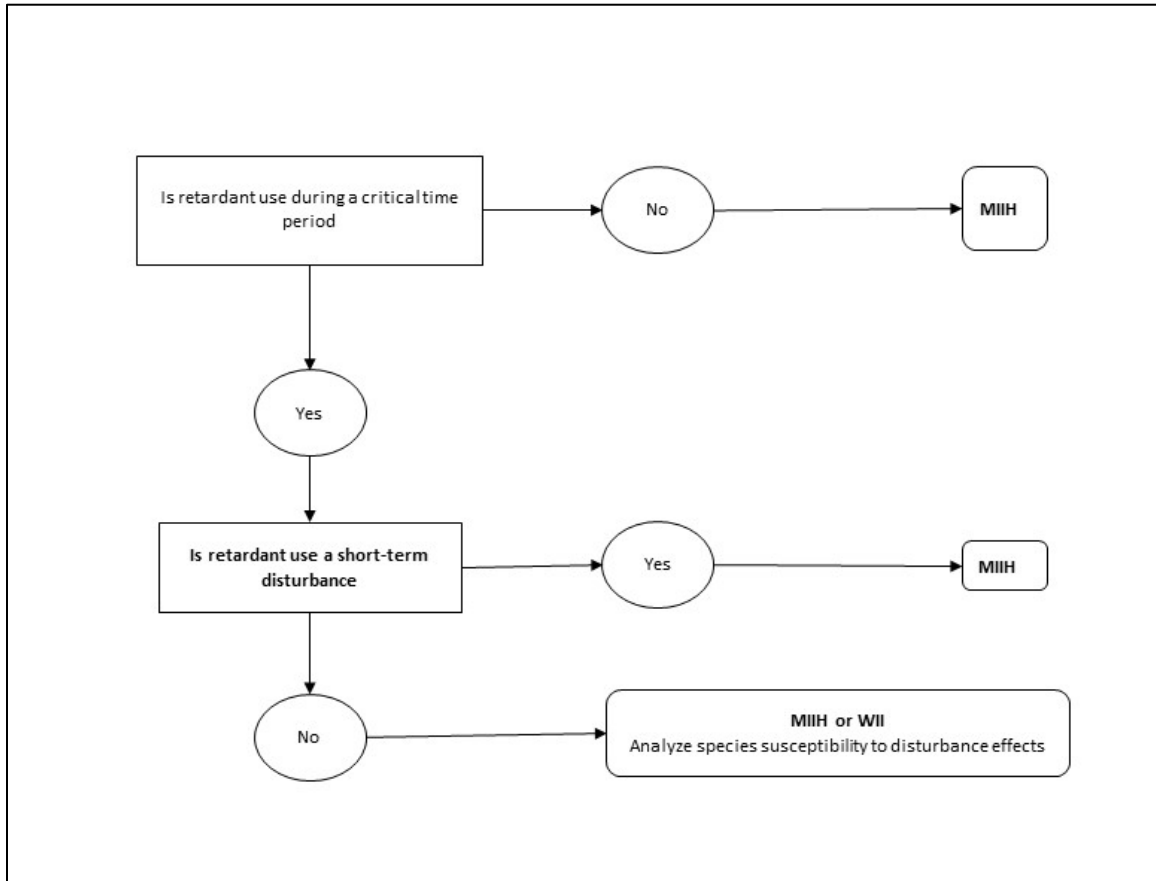


Figure 2. Terrestrial Screen 2: Disturbance

### Terrestrial Screen 3: Ingestion

Retardant chemicals may be ingested directly, through consumption of vegetation or prey coated with retardant or consumption of water with retardant in it, or indirectly through consumption of prey that has consumed retardant. The potential for individuals of a species to ingest retardant, and the potential for retardant chemicals to affect individuals if consumed, was summarized in an ecological risk assessment (Auxilio Management Services 2021). That assessment used data on wildlife species selected to represent a range of taxonomic classes, body sizes, foraging habitat, and diets, for which parameters are generally available. The risk assessment determined an estimated dose for each species based on the above factors, compared it to the published LD50 (the dose at which 50 percent of the sample dies after an established period of time), and used a method established by the Environmental Protection Agency’s Office of Pesticides Programs to assign a risk quotient to each species. Risk of negative effects was indicated at levels one-tenth

the LD50 for a given species. Refer to the ecological risk assessment (Auxilio Management Services 2021).

Potential direct impacts of aerial retardant application vary based on ecoregion, because of differing vegetation types and other factors. Use of this screen involves identifying whether a species is represented by one for which risk was predicted in the ecological risk assessment, and then identifying whether the species occurs in an ecoregion in which the rate of application would result in the predicted risk.

Additional assumptions included in terrestrial screen 3 include:

- Permanent or persistent exposures through terrestrial environmental pathways are not expected because the application “footprint” of these chemicals is expected to be limited relative to the foraging areas and other habitats used by individual animals, and because the ingredients generally degrade in the environment (Auxilio Management Services 2021).
- Bioaccumulation was evaluated in simple predator-prey scenarios. Permanent or persistent exposures are unlikely because retardant is rarely used more than once in the same place and it degrades and dissipates under normal environmental conditions, so long-term biomagnification in the terrestrial food web was not evaluated (Auxilio Management Services 2021).

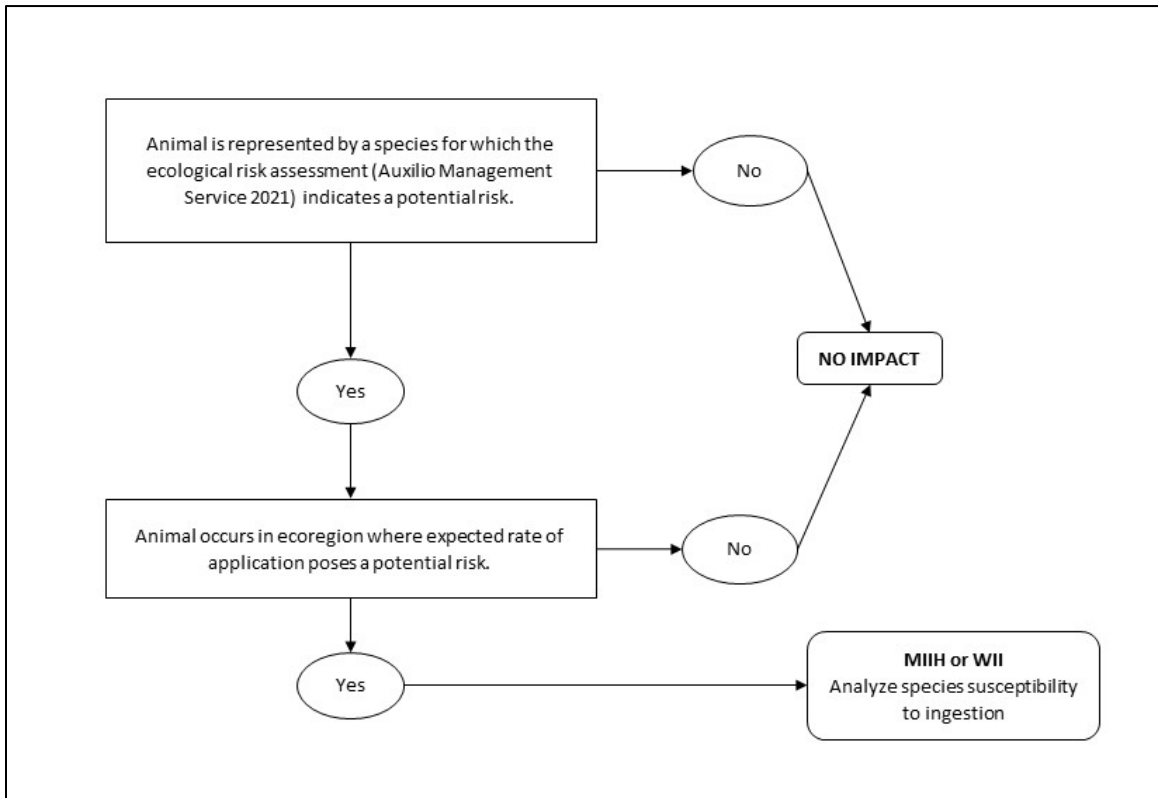


Figure 3. Terrestrial Screen 3: Ingestion

## Aquatic Screen

The fine filter screen for aquatic species and habitats incorporates the following assumptions:

- All aquatic species and habitat are in avoidance areas.
- Retardant intrusion into water is rare (Appendix C), but in general aquatic species in the vicinity of an intrusion are not able to avoid retardant when one occurs.
- There are no identified risks from run-off of current long-term retardant products (Auxilio Management Services 2021), however some movement of wet retardant from vegetation to the stream may occur from post-application rain events.

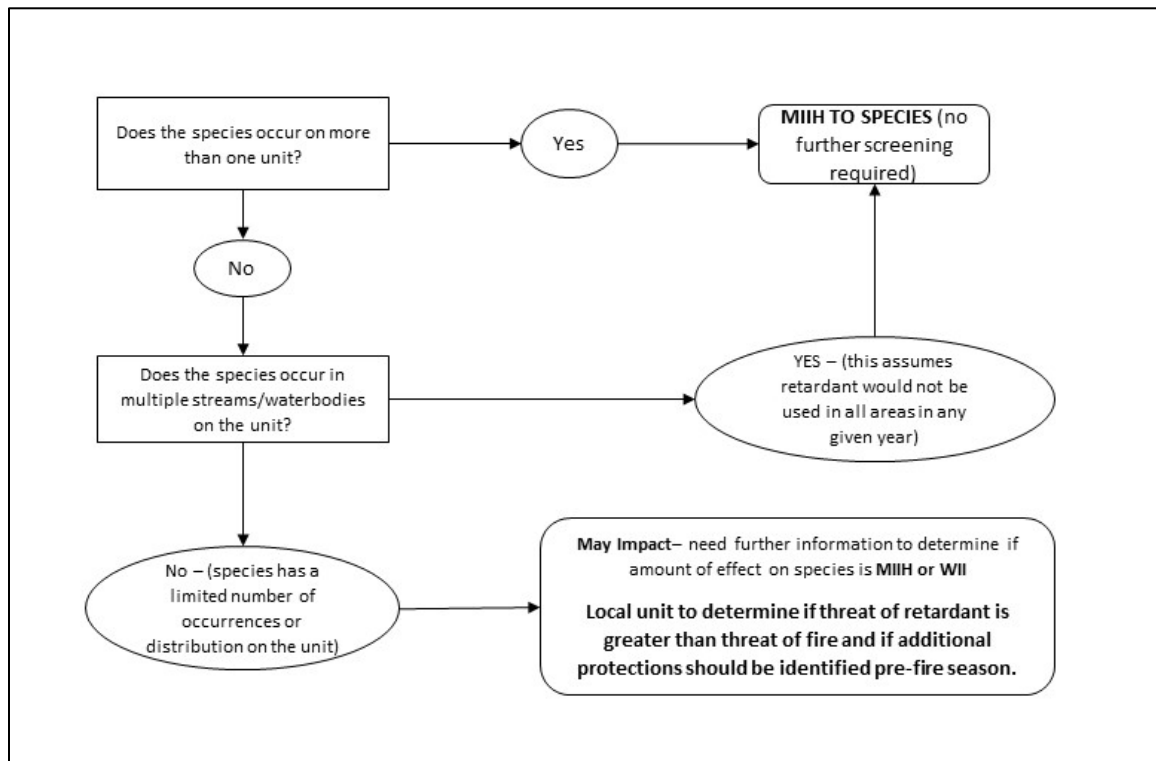


Figure 4. Aquatic Species Screen



## Affected Environment

The Forest Service is comprised of nine Regions covering 193 million acres of land. All National Forest System lands within the United States comprise the affected environment. In some areas, this may extend approximately one mile from National Forest System lands to include those species on the boundary or juxtaposition to National Forest System lands. Amounts of retardant use on terrestrial habitats are estimated by ecoregion (Bailey 1995; table 2) that contain different wildlife and habitat groups. For most of this analysis, the affected environment is described by ecoregion to determine effects on habitat types; however, since most of the data recorded for aerial retardant use are by national forest or Forest Service region, there is not a direct correlation to habitat type by ecoregion. Table 2 displays complete descriptions and retardant application rates for each ecoregion, as well as peak fire season, by ecoregion. The occurrence of peak fire season within an ecoregion is an important consideration in assessing risk to wildlife species, since that is when chemical use is more likely to happen. If chemical application coincides with the presence of vulnerable life stages of a species, adverse impacts may be more likely (Auxilio Management Services 2020).

Fire retardants could be applied wherever a wildfire occurs, and no one ecosystem can represent the variety of site conditions that are found in all areas where wildland fire is possible. Retardant application can occur in various types of vegetation including annual and perennial grasslands, conifer forests, summer and fall hardwood forests, sagebrush with grass, intermediate brush, southern rough vegetation, and mixed chaparral areas. Table 3 shows the representative use of aerially applied fire retardant for each forest and region from 2012-2019. Based on drop tests, retardant does not land evenly. Therefore, the calculations provide a range of acres impacted based on the following assumptions:

- Calculations for each tanker are based on gallons of retardant reported divided by the maximum retardant load for the aircraft multiplied by drop pattern acres.
- Overlap in drops is not accounted for, so the values are a conservative estimate of acres impacted (i.e., a maximum value).

Table 4 lists fire retardants currently approved for use by the Forest Service, along with their ammonia and phosphate concentrations.

Fire fighters and fire planners describe the affected environment by fuel-model type. Firefighters integrate fuel models and fuel descriptions to determine the appropriate retardant coverage level. Fuel models are classified into four fuel-complex groups that include grasses, brush, timber litter, and slash. The fire behavior relates to the fuel loading expressed in tons per acre and the fuel bed depth, which relates to the fuels distribution among the fuel-size classes. Knowing which fuel model a certain habitat type occurs in determines the amount of fire retardant that may be applied to that habitat type.

A determination of the impacts on wildlife habitats can also be assessed by describing impacts to the habitat's ecological function, rather than ecoregion type or fuel-model type. The analysis includes the following wildlife-habitat types (Cooperrider et al. 1996):

- Wetlands, tidal marshes, bogs, springs (with aquatic associated plant species);

- Riverine wash and riparian upland (those areas immediate adjacent to streams and waterways discussed under the aquatics section);
- Arid, semi-arid, or desert; Great Basin, Mojave, Sonoran, and Chihuahuan;
- Grasslands and meadows and pine-oak savannah;
- Brush or chaparral; (including southern rough and pinyon-juniper-sage)
- Fossorial or subterranean;
- Forested (including hardwood, coniferous and mixed forest as well as various seral stages of development and age groups);
- Rocky areas (including outcrops, talus, cliffs, and caves); and
- Arboreal (snags, poles, and other perch sites for birds).

Peak fire season (Auxilio Management Services 2020) and retardant coverage levels based on fuel types and fuel models (Anderson 1982) provide approximations of when and how much retardant could be applied in certain ecoregions of the country. Scott and Burgan (2005) further refined fuel models by including non-burnable fuel types (urban, ice, water, rock) and sub-grouping the fuel complexes by adding moisture-climatic-condition classes along with the fuel loading and distributions.

**Table 2: Representative ecoregions for retardant application**

| <b>Forest Service Region</b> | <b>Description<sup>a</sup></b>   | <b>EcoRegions- Divisions<sup>a</sup></b>   | <b>Geographic Location</b> | <b>Number of Fires 2012 – 2019</b> | <b>Retardant Application (gallons per 100 square feet)</b> | <b>Peak Fire Season<sup>c</sup></b> |
|------------------------------|--|--|----------------------------|------------------------------------|--|-------------------------------------|
| R1                           | shrubland, needleleaf forest annual and perennial grasslands, sagebrush with grass                             | Prairie; Temperate Desert; Temperate Steppe; Temperate Steppe Mountains  | ID, MT, ND, SD, WY         | 6,398                              | 1 to 3   | April - October                     |
| R2                           | shrubland, needleleaf forest, annual and perennial grasslands, sagebrush with grass                            | Temperate Desert; Temperate Desert Mountains; Temperate Steppe; Temperate Steppe Mountains; Tropical/Subtropical Mountains; Tropical/Subtropical Steppe                        | SD, NE, CO, WY             | 4,116                              | 1 to 3   | June - October                      |
| R3                           | shrubland, needleleaf forest, annual and perennial grasslands, woodlands                                       | Temperate Steppe; Temperate Steppe Mountains; Tropical/Subtropical Desert; Tropical/Subtropical Mountains; Tropical/Subtropical Steppe   | AZ, NM                     | 8,665                              | 1 to 4   | May - July                          |
| R4                           | shrubland, needleleaf forest; dry steppe, annual and perennial grasslands, woodlands                           | Mediterranean Mountains; Temperate Desert; Temperate Desert Mountains; Temperate Steppe; Temperate Steppe Mountains; Tropical /Subtropical Desert; Tropical/Subtropical Steppe | NV, UT, WY, ID             | 5,080                              | 1 - 4  | June - October                      |
| R5                           | mosaic of fire adapted woodland/shrubland, needle leaf evergreen and broadleaf woodlands; sagebrush with grass | Mediterranean; Mediterranean Mountains; Temperate Desert; Tropical/Subtropical Desert  | CA                         | 10,415                             | 3 to >6  | August - October                    |

| Forest Service Region | Description <sup>a</sup>  | EcoRegions- Divisions <sup>a</sup>  | Geographic Location | Number of Fires 2012 – 2019 | Retardant Application (gallons per 100 square feet) | Peak Fire Season <sup>c</sup> |
|-----------------------|---|---|---------------------|-----------------------------|---|-------------------------------|
| R6                    | short needle closed conifer; needle leaf evergreen and broadleaf woodlands; sagebrush with grass; short needle conifer                                    | Marine, Marine Mountains; Mediterranean Mountains; Temperate Desert; Temperate Steppe Mountains | OR, WA              | 9,893                       | 3 to 4  | June - October                |
| R8                    | cold-deciduous broadleaf forests; cold-deciduous broadleaf forests; fall hardwood; southern rough; summer hardwood; herbaceous with broadleaf; shrublands | Hot Continental; Hot Continental Mountains; Prairie; Savanna Mountains; Subtropical             | Southeastern U.S.   | 4,867                       | 2   | September - July              |
| R9                    | short and long needle conifer cold-deciduous broadleaf forests; summer hardwood; herbaceous woodlands; shrublands   | Hot Continental; Hot Continental Mountains; Prairie; Warm Continental                           | Northeastern        | 3,234                       | 2   | April - October               |
| R10                   | Pacific coastal mountains and meadows   | Marine Mountains; Subarctic   | AK                  | 115                         | 3 to 6  | June - September              |

<sup>a</sup>Based on Bailey (1995)

<sup>b</sup>Mixed (diluted) product

<sup>c</sup>National Protection Fire Association

**Table 3: Fire and retardant use information by region and forest, 2012 through 2019**

| Forest Service Region | Forest Name               | Acres     | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|-----------------------|---------------------------|-----------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 1                     | Beaverhead-Deerlodge      | 3,393,381 | 497                             | 369  | 46                                  | 664,125                 | 83,016  | 64-146                                | 56-115                                | 0.0019-0.0043%  | 0.0017-0.0034%  |
| 1                     | Bitterroot                | 1,594,659 | 552                             | 324  | 40                                  | 582,587                 | 72,823  | 56-128                                | 49-101                                | 0.0035-0.0080%  | 0.0031-0.0063%  |
| 1                     | Custer Gallatin           | 3,040,134 | 540                             | 176  | 22                                  | 317,046                 | 39,631  | 31-70                                 | 27-55                                 | 0.0010-0.0023%  | 0.0009-0.0018%  |
| 1                     | Dakota Prairie grasslands | 1,257,901 | 128                             | 6  | 1                                   | 10,477                  | 1,310   | 1-2                                   | 1-2                                   | 0.0001-0.0002%  | 0.0001-0.0002%  |
| 1                     | Flathead                  | 2,414,162 | 463                             | 56   | 7                                   | 100,701                 | 12,588  | 10-22                                 | 8-17                                  | 0.0004-0.0009%  | 0.0003-0.0007%  |
| 1                     | Helena-Lewis and Clark    | 2,856,442 | 370                             | 724  | 90                                  | 1,302,675               | 162,834   | 126-287                               | 109-226                               | 0.0044-0.0100%  | 0.0038-0.0079%  |
| 1                     | Idaho-Panhandle           | 2,498,072 | 758                             | 484  | 60                                  | 870,343                 | 108,793   | 84-192                                | 73-151                                | 0.0034-0.0077%  | 0.0029-0.0060%  |
| 1                     | Kootenai                  | 2,243,219 | 687                             | 387  | 48                                  | 697,339                 | 87,167  | 68-154                                | 58-121                                | 0.0030-0.0069%  | 0.0026-0.0054%  |
| 1                     | Lolo                      | 2,216,287 | 1023                            | 2,796  | 350                                 | 5,033,651               | 629,206   | 488-1109                              | 422-873                               | 0.0220-0.0500%  | 0.0190-0.0394%  |
| 1                     | Nez Perce - Clearwater    | 3,935,562 | 1380                            | 733  | 92                                  | 1,319,283               | 164,910   | 128-291                               | 111-229                               | 0.0033-0.0074%  | 0.0028-0.0058%  |

| Forest Service Region    | Forest Name                         | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|-------------------------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| <b>Region 1 Subtotal</b> |                                     | <b>25,449,819</b> | <b>6,398</b>                    | <b>6,055</b>   | <b>757</b>                          | <b>10,898,227</b>       | <b>1,362,278</b>                                  | <b>1056-2401</b>                      | <b>914-1890</b>                       | <b>0.0041-0.0094%</b>   | <b>0.0036-0.0074%</b>   |
| 2                        | Arapaho & Roosevelt                 | 1,597,940         | 404                             | 123  | 15                                  | 221,819                 | 27,727  | 21-49                                 | 19-38                                 | 0.0013-0.0031%  | 0.0012-0.0024%  |
| 2                        | Bighorn                             | 1,105,310         | 106                             | 19   | 2                                   | 33,452                  | 4,182   | 3-7                                   | 3-6                                   | 0.0003-0.0006%  | 0.0003-0.0005%  |
| 2                        | Black Hills                         | 1,251,148         | 589                             | 161  | 20                                  | 289,091                 | 36,136  | 28-64                                 | 24-50                                 | 0.0022-0.0051%  | 0.0019-0.0040%  |
| 2                        | Grand Mesa Uncompahgre and Gunnison | 2,965,320         | 252                             | 61   | 8                                   | 109,297                 | 13,662  | 11-24                                 | 9-19                                  | 0.0004-0.0008%  | 0.0003-0.0006%  |
| 2                        | Medicine Bow-Routt                  | 2,892,559         | 540                             | 474  | 59                                  | 853,602                 | 106,700   | 83-188                                | 72-148                                | 0.0029-0.0065%  | 0.0025-0.0051%  |
| 2                        | Nebraska                            | 1,054,075         | 173                             | 6  | 1                                   | 11,532                  | 1,442   | 1-3                                   | 1-2                                   | 0.0001-0.0003%  | 0.0001-0.0002%  |
| 2                        | Pike and San Isabel                 | 2,757,586         | 890                             | 304  | 38                                  | 547,857                 | 68,482  | 53-121                                | 46-95                                 | 0.0019-0.0044%  | 0.0017-0.0034%  |
| 2                        | Rio Grande                          | 1,838,862         | 114                             | 97   | 12                                  | 173,871                 | 21,734  | 17-38                                 | 15-30                                 | 0.0009-0.0021%  | 0.0008-0.0016%  |
| 2                        | San Juan                            | 1,865,618         | 620                             | 269  | 34                                  | 484,464                 | 60,558  | 47-107                                | 41-84                                 | 0.0025-0.0057%  | 0.0022-0.0045%  |
| 2                        | Shoshone                            | 2,439,091         | 157                             | 291  | 36                                  | 523,740                 | 65,468  | 51-115                                | 44-91                                 | 0.0021-0.0047%  | 0.0018-0.0037%  |

| Forest Service Region    | Forest Name       | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|-------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 2                        | White River       | 2,288,696         | 271                             | 400  | 50                                  | 720,561                 | 90,070  | 70-159                                | 60-125                                | 0.0031-0.0069%  | 0.0026-0.0055%  |
| <b>Region 2 Subtotal</b> |                   | <b>22,056,205</b> | <b>4,116</b>                    | <b>2,205</b>   | <b>276</b>                          | <b>3,969,286</b>        | <b>496,161</b>                                    | <b>385-874</b>                        | <b>333-688</b>                        | <b>0.0017-0.0040%</b>   | <b>0.0015-0.0031%</b>   |
| 3                        | Apache-Sitgreaves | 2,015,925         | 1093                            | 131  | 16                                  | 235,089                 | 29,386  | 23-52                                 | 23-41                                 | 0.0011-0.0026%  | 0.0010-0.0020%  |
| 3                        | Carson            | 1,491,916         | 508                             | 46   | 6                                   | 83,413                  | 10,427  | 8-18                                  | 8-14                                  | 0.0005-0.0012%  | 0.0005-0.0009%  |
| 3                        | Cibola            | 1,879,318         | 500                             | 452  | 57                                  | 813,951                 | 101,744   | 79-179                                | 79-141                                | 0.0042-0.0095%  | 0.0036-0.0075%  |
| 3                        | Coconino          | 1,844,098         | 1787                            | 298  | 37                                  | 537,088                 | 67,136  | 52-118                                | 52-93                                 | 0.0028-0.0064%  | 0.0024-0.0050%  |
| 3                        | Coronado          | 1,719,928         | 609                             | 1,179  | 147                                 | 2,123,058               | 265,382   | 206-468                               | 206-368                               | 0.0120-0.0272%  | 0.0103-0.0214%  |
| 3                        | Gila              | 3,269,965         | 812                             | 466  | 58                                  | 838,779                 | 104,847   | 81-185                                | 81-145                                | 0.0025-0.0057%  | 0.0021-0.0044%  |
| 3                        | Kaibab            | 1,543,675         | 805                             | 61   | 8                                   | 110,178                 | 13,772  | 11-24                                 | 11-19                                 | 0.0007-0.0016%  | 0.0006-0.0012%  |
| 3                        | Lincoln           | 1,095,603         | 298                             | 293  | 37                                  | 527,713                 | 65,964  | 51-116                                | 51-92                                 | 0.0047-0.0106%  | 0.0040-0.0084%  |
| 3                        | Prescott          | 1,257,034         | 364                             | 1.138  | 142                                 | 2,048,302               | 256,038   | 198-451                               | 198-355                               | 0.0158-0.0359%  | 0.0137-0.0282%  |
| 3                        | Santa Fe          | 1,546,059         | 600                             | 339  | 42                                  | 610,190                 | 76,274  | 59-134                                | 59-106                                | 0.0038-0.0087%  | 0.0033-0.0069%  |

| Forest Service Region    | Forest Name      | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 3                        | Tonto            | 2,866,880         | 1289                            | 1,420  | 177                                 | 2,555,214               | 319,402   | 248-563                               | 249-443                               | 0.0087-0.0196%  | 0.0075-0.0155%  |
| <b>Region 3 Subtotal</b> |                  | <b>20,530,401</b> | <b>8,665</b>                    | <b>5,824</b>   | <b>728</b>                          | <b>10,482,975</b>       | <b>1,310,372</b>                                  | <b>878-1997</b>                       | <b>878-1572</b>                       | <b>0.0043-0.0097%</b>   | <b>0.0037-0.0077%</b>   |
| 4                        | Ashley           | 1,378,472         | 145                             | 35   | 4                                   | 63,315                  | 7,914   | 6-14                                  | 5-11                                  | 0.0004-0.0010%  | 0.0004-0.0008%  |
| 4                        | Boise            | 2,204,674         | 695                             | 1,506  | 188                                 | 2,710,760               | 338,845   | 263-597                               | 227-470                               | 0.0119-0.0271%  | 0.0103-0.0213%  |
| 4                        | Bridger-Teton    | 3,432,162         | 300                             | 714  | 89                                  | 1,284,666               | 160,583   | 124-283                               | 108-223                               | 0.0036-0.0082%  | 0.0031-0.0065%  |
| 4                        | Caribou-Targhee  | 2,899,406         | 324                             | 63   | 8                                   | 113,397                 | 14,175  | 11-25                                 | 10-20                                 | 0.0004-0.0009%  | 0.0003-0.0007%  |
| 4                        | Dixie            | 1,632,111         | 358                             | 737  | 92                                  | 1,326,390               | 165,799   | 128-292                               | 111-230                               | 0.0078-0.0179%  | 0.0068-0.0141%  |
| 4                        | Fishlake         | 1,709,014         | 309                             | 195  | 24                                  | 350,182                 | 43,773  | 33-75                                 | 29-59                                 | 0.0019-0.0044%  | 0.0017-0.0035%  |
| 4                        | Humboldt-Toiyabe | 6,253,933         | 810                             | 1,205  | 151                                 | 2,169,855               | 271,232   | 210-478                               | 182-376                               | 0.0034-0.0076%  | 0.0029-0.0060%  |
| 4                        | Manti-La Sal     | 1,340,351         | 363                             | 184  | 23                                  | 331,292                 | 41,412  | 32-73                                 | 28-57                                 | 0.0024-0.0054%  | 0.0021-0.0043%  |
| 4                        | Payette          | 2,310,111         | 486                             | 875  | 109                                 | 1,574,718               | 196,840   | 153-347                               | 132-273                               | 0.0066-0.0150%  | 0.0057-0.0118%  |
| 4                        | Salmon-Challis   | 4,355,403         | 383                             | 440  | 55                                  | 791,114                 | 98,889  | 77-174                                | 66-137                                | 0.0018-0.0040%  | 0.0015-0.0031%  |



| Forest Service Region    | Forest Name         | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|---------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 4                        | Sawtooth            | 2,111,959         | 250                             | 416  | 52                                  | 749,524                 | 93,691  | 73-165                                | 63-130                                | 0.0035-0.0078%  | 0.0030-0.0062%  |
| 4                        | Uinta-Wasatch-Cache | 2,158,851         | 657                             | 1,536  | 192                                 | 2,765,419               | 345,677   | 128-291                               | 111-229                               | 0.0059-0.0135%  | 0.0051-0.0106%  |
| <b>Region 4 Subtotal</b> |                     | <b>31,786,447</b> | <b>5,080</b>                    | <b>7,906</b>   | <b>988</b>                          | <b>14,230,632</b>       | <b>1,778,829</b>                                  | <b>1056-2401</b>                      | <b>914-1890</b>                       | <b>0.0033-0.0076%</b>   | <b>0.0029-0.0059%</b>   |
| 5                        | Angeles             | 668,279           | 1110                            | 2,099  | 262                                 | 3,777,882               | 472,235   | 366-832                               | 317-655                               | 0.0548-0.1254%  | 0.0474-0.0980%  |
| 5                        | Cleveland           | 426,804           | 625                             | 1,297  | 162                                 | 2,334,163               | 291,770   | 226-514                               | 196-405                               | 0.0530-0.1204%  | 0.0459-0.0949%  |
| 5                        | Eldorado            | 615,035           | 434                             | 787  | 98                                  | 1,416,203               | 177,025   | 137-312                               | 119-246                               | 0.0223-0.0507%  | 0.0193-0.0400%  |
| 5                        | Inyo                | 1,987,906         | 367                             | 494  | 62                                  | 889,980                 | 111,248   | 86-196                                | 75-154                                | 0.0043-0.0099%  | 0.0038-0.0077%  |
| 5                        | Klamath             | 1,505,983         | 767                             | 2,288  | 286                                 | 4,118,014               | 514,752   | 399-907                               | 345-714                               | 0.0265-0.0602%  | 0.0229-0.0474%  |
| 5                        | LTBMU               | 154,268           | 332                             | 1  | 0                                   | 2,075                   | 259   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 5                        | Lassen              | 1,154,416         | 329                             | 333  | 42                                  | 599,516                 | 74,940  | 58-132                                | 50-104                                | 0.0050-0.0114%  | 0.0043-0.0090%  |
| 5                        | Los Padres          | 1,780,182         | 253                             | 5,160  | 645                                 | 9,287,593               | 1,160,949   | 900-2046                              | 779-1611                              | 0.0506-0.1149%  | 0.0438-0.0905%  |
| 5                        | Mendocino           | 918,349           | 136                             | 412  | 52                                  | 741,948                 | 92,744  | 72-163                                | 62-129                                | 0.0078-0.0177%  | 0.0068-0.0140%  |

| Forest Service Region    | Forest Name          | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|----------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 5                        | Modoc                | 1,679,173         | 709                             | 1,071  | 134                                 | 1,927,851               | 240,981   | 187-425                               | 162-334                               | 0.0111-0.0253%  | 0.0096-0.0199%  |
| 5                        | Plumas               | 1,205,685         | 794                             | 1,021  | 128                                 | 1,838,511               | 229,814   | 178-405                               | 154-319                               | 0.0148-0.0336%  | 0.0128-0.0265%  |
| 5                        | San Bernardino       | 673,294           | 1069                            | 3,313  | 414                                 | 5,962,980               | 745,373   | 578-1314                              | 500-1034                              | 0.0858-0.1952%  | 0.0743-0.1536%  |
| 5                        | Sequoia              | 1,114,954         | 436                             | 2,097  | 262                                 | 3,773,826               | 471,728   | 366-831                               | 317-655                               | 0.0239-0.0745%  | 0.0261-0.0587%  |
| 5                        | Shasta-Trinity       | 2,139,325         | 999                             | 1,927  | 241                                 | 3,467,858               | 433,482   | 336-764                               | 291-601                               | 0.0157-0.0357%  | 0.136-0.0281%   |
| 5                        | Sierra               | 1,316,193         | 504                             | 3,712  | 464                                 | 6,681,406               | 835,176   | 647-1472                              | 560-1159                              | 0.0492-0.1118%  | 0.0425-0.0881%  |
| 5                        | Six Rivers           | 1,167,659         | 438                             | 785  | 98                                  | 1,412,888               | 176,611   | 137-311                               | 119-245                               | 0.0117-0.0266%  | 0.0102-0.0210%  |
| 5                        | Stanislaus           | 898,739           | 440                             | 1,475  | 184                                 | 2,655,013               | 331,877   | 257-585                               | 223-460                               | 0.0286-0.0651%  | 0.0248-0.0512%  |
| 5                        | Tahoe                | 854,807           | 673                             | 442  | 55                                  | 795,873                 | 99,484  | 77-175                                | 67-138                                | 0.0090-0.0205%  | 0.0078-0.0161%  |
| <b>Region 5 Subtotal</b> |                      | <b>20,261,051</b> | <b>10,415</b>                   | <b>28,713</b>  | <b>3,589</b>                        | <b>51,683,580</b>       | <b>6,460,448</b>                                  | <b>5007-11387</b>                     | <b>4335-8964</b>                      | <b>0.0247-0.0562%</b>   | <b>0.0214-0.0442%</b>   |
| 6                        | Columbia River Gorge | 83,339            | 138                             | 10   | 1                                   | 17,248                  | 2,156   | 2-4                                   | 1-3                                   | 0.0024-0.0048%  | 0.0012-0.0036%  |
| 6                        | Colville             | 1,104,904         | 355                             | 242  | 30                                  | 434,907                 | 54,363  | 42-96                                 | 36-75                                 | 0.0038-0.0087%  | 0.0033-0.0068%  |

| Forest Service Region | Forest Name          | Acres     | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|-----------------------|----------------------|-----------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 6                     | Deschutes and Ochoco | 2,338,099 | 1856                            | 719  | 90                                  | 1,294,840               | 161,855   | 125-285                               | 109-225                               | 0.0053-0.0122%  | 0.0047-0.0096%  |
| 6                     | Fremont-Winema       | 2,253,654 | 809                             | 248  | 31                                  | 445,661                 | 55,708  | 43-98                                 | 37-77                                 | 0.0019-0.0043%  | 0.0016-0.0034%  |
| 6                     | Gifford Pinchot      | 1,357,447 | 262                             | 114  | 14                                  | 204,580                 | 25,573  | 20-45                                 | 17-35                                 | 0.0015-0.0033%  | 0.0013-0.0026%  |
| 6                     | Malheur              | 1,722,070 | 787                             | 526  | 66                                  | 946,825                 | 118,353   | 92-209                                | 79-164                                | 0.0053-0.0121%  | 0.0046-0.0095%  |
| 6                     | Mt. Baker-Snoqualmie | 1,762,266 | 384                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 6                     | Mt Hood              | 1,015,873 | 644                             | 56   | 7                                   | 100,219                 | 12,527  | 10-22                                 | 8-17                                  | 0.0010-0.0022%  | 0.0008-0.0017%  |
| 6                     | Okanogan-Wenatchee   | 4,010,517 | 1003                            | 1,653  | 207                                 | 2,975,955               | 371,994   | 288-656                               | 250-516                               | 0.0072-0.0164%  | 0.0062-0.0129%  |
| 6                     | Olympic              | 632,646   | 59                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 6                     | Rogue River-Siskiyou | 1,719,305 | 721                             | 1,118  | 140                                 | 2,012,446               | 251,556   | 195-443                               | 169-349                               | 0.0113-0.0258%  | 0.0098-0.0203%  |
| 6                     | Siuslaw              | 630,204   | 122                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 6                     | Umatilla             | 1,404,806 | 547                             | 393  | 49                                  | 707,359                 | 88,420  | 69-156                                | 59-123                                | 0.0049-0.0111%  | 0.0042-0.0088%  |
| 6                     | Umpqua               | 986,610   | 593                             | 233  | 29                                  | 419,817                 | 52,477  | 41-92                                 | 35-73                                 | 0.0042-0.0093%  | 0.0035-0.0074%  |

| Forest Service Region    | Forest Name                     | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|---------------------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 6                        | Wallowa-Whitman                 | 2,403,487         | 733                             | 610  | 76                                  | 1,098,137               | 137,267   | 106-242                               | 92-190                                | 0.0044-0.0101%  | 0.0038-0.0079%  |
| 6                        | Willamette                      | 1,689,648         | 880                             | 88   | 11                                  | 158,428                 | 19,804  | 15-35                                 | 13-27                                 | 0.0009-0.0021%  | 0.0008-0.0016%  |
| <b>Region 6 Subtotal</b> |                                 | <b>25,114,875</b> | <b>9,893</b>                    | <b>6,009</b>   | <b>751</b>                          | <b>10,816,422</b>       | <b>1,352,053</b>                                  | <b>1048-2383</b>                      | <b>907-1876</b>                       | <b>0.0042-0.0095%</b>   | <b>0.0036-0.0075%</b>   |
| 8                        | Chattahoochee-Oconee            | 867,578           | 283                             | 10   | 1                                   | 17,420                  | 2,178   | 2-3                                   | 1-3                                   | 0.0002-0.0005%  | 0.0001-0.0003%  |
| 8                        | Cherokee                        | 660,211           | 208                             | 11   | 1                                   | 19,954                  | 2,494   | 2-4                                   | 2-3                                   | 0.0003-0.0006%  | 0.0003-0.0005%  |
| 8                        | Daniel Boone                    | 709,856           | 383                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | El Yunque                       | 28,805            | 0                               | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | Francis Marion & Sumter         | 635,197           | 251                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | George Washington and Jefferson | 1,799,145         | 185                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | Kisatchie                       | 608,535           | 326                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | Land Between the Lakes NRA      | 171,239           | 29                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |

| Forest Service Region    | Forest Name           | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|-----------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 8                        | NFs in Alabama        | 671,667           | 302                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | NFs in Florida        | 1,203,415         | 679                             | 55   | 7                                   | 99,660                  | 12,458  | 10-22                                 | 8-17                                  | 0.0008-0.0018%  | 0.0007-0.0014%  |
| 8                        | NFs in Mississippi    | 1,191,206         | 563                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | NFs in North Carolina | 1,256,188         | 685                             | 11   | 1                                   | 19,583                  | 2,448   | 2-4                                   | 2-3                                   | 0.0002-0.0003%  | 0.0002-0.0002%  |
| 8                        | NF in Texas           | 677,696           | 289                             | 6  | 1                                   | 11,200                  | 1,400   | 1-2                                   | 1-2                                   | 0.0001-0.0003%  | 0.0001-0.0003%  |
| 8                        | Ouachita              | 1,783,951         | 418                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 8                        | Ozark-St. Francis     | 1,160,921         | 266                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| <b>Region 8 Subtotal</b> |                       | <b>13,425,610</b> | <b>4,867</b>                    | <b>93</b>  | <b>12</b>                           | <b>167,817</b>          | <b>20,977</b>                                     | <b>16-37</b>                          | <b>14-29</b>                          | <b>0.0001-0.0003%</b>   | <b>0.0001-0.0002%</b>   |
| 9                        | Allegheny             | 513,794           | 51                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Chequamegon-Nicolet   | 1,525,127         | 146                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Chippewa              | 672,128           | 253                             | 6  | 1                                   | 10,796                  | 1,350   | 1-2                                   | 1-2                                   | 0.0001-0.0003%  | 0.0001-0.0003%  |

| Forest Service Region    | Forest Name                     | Acres             | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|--------------------------|---------------------------------|-------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 9                        | Green Mountain and Finger Lakes | 427,053           | 32                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Hiawatha                        | 898,451           | 98                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Hoosier                         | 204,274           | 104                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Huron-Manistee                  | 978,891           | 859                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Mark Twain                      | 1,507,887         | 848                             | 10   | 1                                   | 18,170                  | 2,271   | 2-4                                   | 2-3                                   | 0.0001-0.0003%  | 0.0001-0.0002%  |
| 9                        | Midewin                         | 18,225            | 10                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Monongahela                     | 920,783           | 40                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Ottawa                          | 998,994           | 48                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Shawnee                         | 286,311           | 125                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | Superior                        | 2,173,267         | 227                             | 47   | 6                                   | 84,126                  | 10,516  | 8-19                                  | 7-15                                  | 0.0004-0.0009%  | 0.0003-0.0007%  |
| 9                        | Wayne                           | 244,258           | 348                             | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| 9                        | White Mountain                  | 807,799           | 45                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| <b>Region 9 Subtotal</b> |                                 | <b>12,177,242</b> | <b>3,234</b>                    | <b>63</b>  | <b>8</b>                            | <b>113,092</b>          | <b>14,137</b>                                     | <b>11-5</b>                           | <b>9-20</b>                           | <b>0.0001-0.0002%</b>   | <b>0.0001-0.0002%</b>   |
| 10                       | Chugach                         | 5,400,752         | 48                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |

| Forest Service Region     | Forest Name | Acres              | Total Number of Fires 2012-2019 | Estimated Number of Retardant Drops 2012-2019 <sup>1</sup> | Average Drops per Year <sup>2</sup> | Total Gallons 2012-2019 | Average Gallons per Year 2012 – 2019 <sup>3</sup> | Acres of Impact at 4 gpc <sup>3</sup> | Acres of Impact at 8 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 4 gpc <sup>3</sup> | Percent National Forest System Land with Fire Retardant at 8 gpc <sup>3</sup> |
|---------------------------|-------------|--------------------|---------------------------------|--|-------------------------------------|-------------------------|---|---------------------------------------|---------------------------------------|---|---|
| 10                        | Tongass     | 16,747,705         | 67                              | 0  | 0                                   | 0                       | 0   | 0                                     | 0                                     | 0.0000%   | 0.0000%   |
| <b>Region 10 subtotal</b> |             | <b>22,148,457</b>  | <b>115</b>                      | <b>0</b>   | <b>0</b>                            | <b>0</b>                | <b>0</b>  | <b>0</b>                              | <b>0</b>                              | <b>0.0000%</b>  | <b>0.0000%</b>  |
| <b>TOTAL</b>              |             | <b>192,950,107</b> | <b>52,783</b>                   | <b>56,868</b>  | <b>7,108</b>                        | <b>102,362,031</b>      | <b>12,795,254</b>                                 | <b>9916-22552</b>                     | <b>8586-17753</b>                     | <b>0.0051-0.0117%</b>   | <b>0.0044-0.0092%</b>   |

<sup>1</sup>Data derived from National Interagency Fire Center ABS database, estimated at 1,800 gallons per drop

<sup>2</sup>Data averaged over 2012-2019

<sup>3</sup>gpc = 100 ft<sup>2</sup>; 4 gpc = 4 gallons/100 ft<sup>2</sup> = 1,740 gallons/acre; 8 gpc = 8 gallons/100ft<sup>2</sup> = 3,480 gallons/acre; 1 acre = 43,500 ft<sup>2</sup>

**Table 4: Component amounts of fire retardants currently on the Qualified Products List**

| <b>Nutrients Delivered at Specific Coverage Levels<sup>1</sup></b> |   |   |   |   |
|--|---|---|---|---|
| <b>Retardant</b>   | <b>pounds of ammonia per square foot delivered at 4 gallons per square foot retardant</b>   | <b>pounds of phosphate per square foot delivered at 4 gallons per square foot retardant</b> | <b>pounds of ammonia per square foot delivered at 8 gallons per square foot retardant</b>   | <b>pounds of phosphate per square foot delivered at 8 gallons per square foot retardant</b> |
| Phos-Chek LC-95A-R   | 0.0095  | 0.0301  | 0.0190  | 0.0602  |
| Phos-Chek LC-95A-Fx  | 0.0095  | 0.0273  | 0.0191  | 0.0546  |
| Phos-Chek LC-95-W  | 0.0095  | 0.0276  | 0.0191  | 0.0553  |
| Phos-Chek MVP-Fx   | 0.0053  | 0.0199  | 0.0105  | 0.0399  |
| Phos-Chek 259-Fx   | 0.0070  | 0.0203  | 0.0140  | 0.0406  |
| Phos-Chek LCE20-Fx   | 0.0073  | 0.0208  | 0.0147  | 0.0415  |
|  | <b>pounds of magnesium per square foot delivered at 4 gallons per square foot retardant</b> | <b>pounds of chloride per square foot delivered at 4 gallons per square foot retardant</b>  | <b>pounds of magnesium per square foot delivered at 8 gallons per square foot retardant</b> | <b>pounds of chloride per square foot delivered at 8 gallons per square foot retardant</b>  |
| Fortress FR-100  | 0.0093  | 0.0270  | 0.0185  | 0.0541  |
| Fortress FR-200 LLX  | 0.0094  | 0.0275  | 0.0188  | 0.0549  |

<sup>1</sup>Source: Hunter Jones, Project Leader-Chemist, Wildland Fire Chemicals, Forest Service National Technology and Development Program

Data collected from 2012 through 2019 indicate that Regions 2, 8, 9, and 10 use relatively low amounts of retardant, annually, when compared to the other regions; Regions 3, 4, and 6 use similar amounts ranging from an average of 1.3 to 1.8 million gallons annually; Region 5 uses the most retardant, averaging 6.5 million gallons annually (table 3). The percent of National Forest System land receiving aerial application of fire retardant during the 2012 through 2019 reporting period had an average annual range of 0.0051-0.0117 percent of National Forest System lands at 4 gallons per 100 square feet, and an average annual range of 0.0045-0.0092 percent of National Forest System lands at 8 gallons per 100 square feet. No one forest exceeded more than 0.1952 percent (San Bernardino National Forest) of its land base annually. Retardant applications are based on a number of factors including fuel type, application rates, delivery systems, and other fire-fighting tactics. Application rates range between 1 and 8 gallons per 100 square feet, with the majority of applications being between 4 and 8 gallons per 100 square feet (Johnson 2010). Usually, the width and length of a retardant drop varies based on the type of aircraft used for delivery. An average drop is 50 to 75 ft wide by up to 800 ft long. Depending on fire-fighting tactics, retardant drops may be strung together creating a continuous path of retardant on the ground or used to create a barrier in combination with other naturally occurring barriers to the advancement of fires (i.e. ridgetops, roads, waterways).



Intrusion data gathered annually for the period of 2012 through 2019 show the number of fires on National Forest System lands with intrusions averaged 0.46 percent (range 0.28 to 0.61 percent). The total number of intrusions divided by the estimated number of retardant drops averaged 0.80 percent (range 0.56 to 1.52 percent) across all years (Appendix C).

## Environmental Consequences

This section focuses on the effects of aerial application of fire retardant on terrestrial and aquatic wildlife species and their habitats. This analysis addresses 1058 sensitive species (Appendix A), in habitats ranging from arid and semi-arid to riparian, upland, forest, rocky areas, and many others. Appendix A lists sensitive species by group and indicates in which regions they occur. The analysis of impacts in this biological evaluation is broadly programmatic, with effects described for entire taxonomic groups (for example crustaceans, mammals, birds). The analysis of effects for each group is expected to apply to all species within that group, regardless of whether they are identified as Regional Forester Sensitive Species.

Because of the large number of species evaluated, the discussion of environmental consequences is organized as follows:

- Each group is a major animal type: Mammals, Birds, Reptiles, Amphibians, Invertebrates, Fish.
- Each subgroup is similar species within the larger group (e.g., Mammals: rodents, bats, ungulates, etc.)
- Analysis was conducted on the group or subgroup rather than each individual species.

## Analysis of Effects Common to All Sensitive Species

The analysis conducted was on a broad scale and can be applied to all species within the group (i.e., Mammals, Birds, Reptiles, Invertebrates, Amphibians, or Fish) or subgroup (e.g., small mammals, bats, ungulates, etc.) listed above regardless of forest and grassland land and resource management plans, or Forest Service policy.

Given the programmatic nature of this environmental analysis, this assessment uses qualitative rather quantitative values due to the impossibility of accurately predicting where and when the aerial application of fire retardant will be used as a firefighting tool, or how much it will be used.

Regardless of whether fire retardant is used, the following assumptions may be made concerning large wildland fires (Geier-Hayes 2011), they:

- often burn for long durations in a variety of weather and fuel conditions that can produce high fire severity effects across a large area.
- have more potential to affect a greater proportion of the population of a species or their habitats at one time, particularly for endemics or species whose populations or habitats are limited in distribution or have been affected by fragmentations or changes in land use surrounding them.
- have the potential to increase the spread of non-native plant species, which favor ground disturbances, and thus, may reduce the quality of habitat for native species.

# Potential Direct and Indirect Effects Common to All Sensitive Species

## Chemical Risks

An Ecological Risk Assessment (Auxilio Management Services 2020, 2021a, 2021b, 2021c) was prepared for the Forest Service for chemicals used as long-term fire retardants. The risk assessment uses the ecoregions classifications described by Bailey (1995; table 2) and considers areas of the United States where firefighting chemicals are more likely to be applied. The results are summarized below.

## Potential Effects

The ecological effects to wildlife that may be caused by retardants include direct toxicity to terrestrial wildlife and aquatic species that encounter the chemical and effects on vegetation diversity that could impact habitat. Some ingredients in the retardant products, either individually or as a mixture with other ingredients, have demonstrated toxicity to terrestrial and aquatic wildlife and plant species, at varying levels, based on laboratory and field tests. Environmental exposure to the chemical(s) is hypothesized to result in adverse effects to an individual's survival, growth, and reproduction for sensitive species, or to the survival of populations of non-sensitive species. Specifically, it is hypothesized that direct contact or soil-, water-, or diet-mediated exposure may occur at levels predicted to be associated with adverse individual or population-level effects.

Permanent or persistent exposures through terrestrial environmental pathways are not expected, since the application "footprint" of these chemicals is quite limited in terms of foraging areas and species habitat for any individual animal, and the ingredients generally degrade in the environment. Although bioaccumulation was evaluated in simple predator-prey scenarios, the potential for long-term biomagnification in the terrestrial food web was not evaluated for this same reason. Although effort is made to avoid or minimize application into waterways, including ponds, the potential for impacts from persistent aquatic exposure to ammonia from the retardant salts was evaluated, as some aquatic species could be limited to habitats, such as ponds, where exposure would be longer term.

Fire is an integral component to and may have beneficial impacts on ecosystems. Adverse effects to an ecosystem could occur in terms of a decrease in fire-based beneficial effects. These effects are not directly related to risks from the chemicals specifically, but are tied to fire management and suppression decision-making regarding all methods of fire suppression.

## Risk Assessment Process

Each retardant formulation was screened for ingredients with high toxicity to wildlife, as determined by a mammalian oral median lethal dose (LD<sub>50</sub>) less than 500 milligrams of chemical per kilogram of body weight (mg/kg), or an acute aquatic species median lethal concentration (LC<sub>50</sub><sup>1</sup>) less than 10 milligrams of chemical per liter of water (mg/L). These screening thresholds were based on inclusion of chemicals defined by EPA, in terms of their acute toxicity, as moderately, highly, or very highly toxic.

---

<sup>1</sup> The concentration of product in water that results in the death of 50 percent of the aquatic test specimens within a specified time frame; expressed as milligrams of product in a liter of solution.

For chemicals with high toxicity, profiles were prepared summarizing toxicity, chemical and physical and properties, and environmental fate and transport. Environmental fate and exposure models were implemented to estimate exposures in terms of dose (mg/kg) for terrestrial species or concentration (mg/L) for aquatic species. The doses and water concentrations identified in the exposure characterization were compared to the toxic properties identified in the effects characterization (i.e., LD<sub>50</sub>, LC<sub>50</sub>), using the guidelines developed by EPA for interpreting risk estimates to wildlife and aquatic species.

Representative terrestrial species analyzed in the risk assessment include:

Mammals: deer (*Odocoileus* spp., large herbivore); coyote (*Canis latrans*, carnivore); deer mouse (*Peromyscus maniculatus*, omnivore, prey species); rabbit (*Sylvilagus* spp., small herbivore); cow (*Bos taurus*; ruminant)

Birds: American kestrel (*Falco sparverius*; raptor); red-winged blackbird (*Agelaius phoeniceus*, songbird); bobwhite quail (*Colinus virginianus*, ground nester)

These particular wildlife species were selected because they represent a range of taxonomic classes, body sizes, foraging habitat, and diets for which parameters are generally available. For each species, characteristics (body weight, dietary intake, composition of diet, and home range/foraging area) were identified that were used in estimating doses of ingredients in the retardants. There were insufficient data available on the toxicity of the retardant products and their ingredients to reptiles and terrestrial stages of amphibians to include representatives of these classes in the analysis.

The terrestrial species exposure scenarios hypothesize that a variety of terrestrial wildlife species may encounter residues of retardants when they re-enter areas after fire-fighting activities have subsided. The scenarios further hypothesize that these terrestrial species may be exposed to any applied chemicals through ingestion of contaminated food and water. Therefore, food item doses were added to the estimated doses from the animal drinking all of its water from a small stream that received runoff to predict the total ingestion dose to terrestrial species.

The aquatic species exposure scenarios hypothesize that tadpoles and aquatic invertebrates in small and large streams may be exposed to ingredients in retardant products through contaminated runoff coming off of areas to which the chemicals had been applied, or as a result of an accidental spill or drop into a stream. For each chemical, risks were estimated for aquatic species for which ecotoxicity data are available. Relevant representative aquatic species are as follows: rainbow trout (*Oncorhynchus mykiss*); water flea (*Daphnia* spp.; aquatic invertebrate); tadpoles of frog or toad species (depending on data available; aquatic stages of amphibians). In addition, a brief evaluation of risks from ammonia in the retardant products to freshwater mussels was conducted. A lack of toxicity data precluded quantification of risks to other benthic organisms.

With respect to tadpoles, the concentrations of the chemicals in streams were estimated using the environmental fate and transport modeling methodologies described in Section 3.1 of the Risk Assessment.

#### ***Estimated Risks to Terrestrial Wildlife***

Following is a summary of estimated risks to terrestrial wildlife from long-term retardants:

- The retardant salt in 3 retardant products was predicted to pose a direct toxicity risk to small sensitive omnivores when applied at rates of 2 gallons per 100 square feet and greater, to sensitive raptors when applied at 4 gallons per 100 square feet and greater, and to sensitive songbirds when applied at 3 gallons per 100 square feet and greater (table 5).
- The mixtures of individual ingredients in 4 products were predicted to present an additive direct toxicity risk to some sensitive species.
- All retardant products posed a direct toxicity risk to some sensitive terrestrial animals at certain rates of application when evaluated based on the toxicity data for the formulated product as a whole. In most cases, these risks were consistent with or less than those predicted for the product based on evaluation of individual or additive risks from its ingredients.

**Table 5: Product toxicity risk summary, by application rate, for terrestrial species**

| <b>Product Name</b>  | <b>Product Risk to Sensitive Species by Application Rate (gallons per 100 square feet<sup>a</sup>)</b> | <b>Additive Risk to Sensitive Species by Application Rate (gallons per 100 square feet<sup>a</sup>)</b> |
|--|--|---|
| Phos-Chek LC-95A-R<br>Phos-Chek LC-95A-FX<br>Phos-Chek LC-95-W | deer mouse: 3, 4, 6<br>American kestrel: 6<br>red-winged blackbird: 6                                  | deer mouse: 2, 3, 4, 6<br>American kestrel: 4, 6<br>red-winged blackbird: 3, 4, 6                       |
| Phos-Chek MVP-Fx   | Deer mouse: 6  | deer mouse: 4, 6  |
| Phos-Chek 259-Fx   | Deer mouse: 6  | deer mouse: 6   |
| Phos-Chek LCE20-Fx   | deer mouse: 3, 4, 6<br>American kestrel: 6<br>red-winged blackbird: 6                                  | deer mouse: 6   |
| Fortress FR-100  | deer mouse: 3, 4, 6<br>American kestrel: 6<br>red-winged blackbird: 6                                  | NA  |
| Fortress FR-200 LLX  | deer mouse: 2, 3, 4, 6<br>American kestrel: 4, 6<br>red-winged blackbird: 3, 4, 6                      | NA  |

<sup>a</sup> refers to application rate based on ecoregion (table 2)

### *Estimated Risks to Aquatic Species*

#### **Acute Toxicity from Intended Applications and Accidents**

Risks were not predicted from any of the long-term retardants due to runoff from land where the retardant was applied to fuels (vegetation). The runoff exposure scenario is intended to predict risks to aquatic species from non-accidental use; that is, when all application guidelines are followed and no spills or applications across streams occur.

Table 6 summarizes the estimated risks of direct toxicity to aquatic species from the retardant products in the case of an accidental or unavoidable retardant application across a stream. Two retardants salts and 2 pigment ingredients present in multiple products, and 1 additive risk from individual ingredients, were predicted to pose risks to sensitive tadpoles or aquatic invertebrates.

**Table 6: Estimated risks to aquatic species from accidental application of mixed retardant**

| Product             | Stream Size | Applied Rate (gpc) <sup>a</sup> | Representative Species                           | Risk to Sensitive Species | Risk to Non-Sensitive Species <sup>b</sup> |
|---------------------|-------------|---------------------------------|--|---------------------------|--|
| Phos-Chek MVP-Fx    | small       | 6<br>3, 4, 6<br>4, 6            | Tadpole<br>rainbow trout<br><i>Daphnia magna</i> | X                         | NA   |
| Phos-Chek 259-Fx    | small       | 2, 3, 4, 6<br>3, 4, 6           | rainbow trout<br><i>Daphnia magna</i>            | X                         | NA   |
| Phos-Chek LC-95A-R  | small       | 3, 4, 6                         | rainbow trout                                    | X                         | NA   |
| Phos-Chek LC-95A-Fx | small       | 3, 4, 6<br>4, 6                 | rainbow trout<br><i>Daphnia magna</i>            | X                         | NA   |
| Phos-Chek LCE20-Fx  | small       | 3, 4, 6<br>1, 2, 3, 4, 6        | rainbow trout<br><i>Daphnia magna</i>            | X                         | NA   |
| Phos-Chek LCE20-Fx  | large       | 6                               | <i>Daphnia magna</i>                             | X                         | NA   |
| Phos-Chek LC-95W    | small       | 3, 4, 6                         | rainbow trout                                    | X                         | NA   |
| Fortress FR-100     | small       | 6                               | <i>Daphnia magna</i>                             | X                         | NA   |
| Fortress FR-200 LLX | small       | 6                               | <i>Daphnia magna</i>                             | X                         | NA   |

<sup>a</sup> refers to gallons per 100 square feet based on ecoregion (table 2)

<sup>b</sup> Risk quotients are listed in the Risk Assessment (Auxilio Management Services 2021c).

Accidental spills were far more likely to lead to a prediction of risk in this analysis compared to applications across a stream. All retardant products present a significant risk to sensitive aquatic species when concentrate or mix is spilled into small or large streams at the volumes assumed in the risk assessment. In most cases, risks were predicted to non-sensitive species as well. However, accidental spills are highly unlikely to occur. All Forest Service air tanker bases have washdown facilities (sand-oil separators, containment/evaporation lagoons) to accommodate errant retardant. Accidental spills are tracked through the Retardant Use Report that each airtanker base completes at the end of each season, and the information is used, in part, for the EPA TRI<sup>2</sup> reporting database. EPA reporting only applies to airtanker bases, not mobile retardant bases (i.e., helibases) (S. Zylstra, personal communication). Mobile retardant bases are required to include spill containment systems and contracts include environmental controls such as the following:

- The Mobile Retardant Base site will be at least 300 feet from any waterway, including seasonal lakes or streams, if water is present.
- The Contractor and the Agency Representative at the incident will jointly develop a Site Spill Management Plan.
- The Retardant Contractor will be responsible for the removal and disposal of chemical residue and chemical spills created in the retardant mixing area or due to accident or

<sup>2</sup> Toxics Release Inventory (TRI) is a resource for learning about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities.

negligence of retardant personnel. All clean-up and disposal will be accomplished in accordance with state and federal environmental regulations.

### **Risks from Sublethal or Longer-Term Ammonia Exposure**

Data that have been generated on the toxicity of ammonia to aquatic species are dependent on site-specific pH, since at higher pH, the balance of un-ionized ammonia (NH<sub>3</sub>) relative to ionized ammonium (NH<sub>4</sub><sup>+</sup>) shifts to favor the more toxic unionized NH<sub>3</sub>. Using terminology published by EPA, specifically for its acute toxicity, ammonia can be considered very highly toxic to bivalves and highly toxic to other aquatic invertebrates and aquatic stages of amphibians, and result in lethal effects. Short-term, sublethal effects include pre-copulation pair disruption (amphipods), growth effects (plain pocketbook, bivalve), effects on length and weight (African clawed toad tadpoles). Long-term effects include effects on survival and reproduction (water flea, aquatic invertebrate; fingernail clam, bivalve; green frog tadpole). Two products (Phos-Chek 259-Fx and Phos-Chek LCE20-Fx) may pose risks of sublethal effects from long-term exposures to ammonia for bivalves based on very conservative (unlikely to underestimate) assumptions about the amount of un-ionized ammonia present. For mussels and other aquatic species, a highly unlikely accidental spill of concentrated or mixed retardant, particularly in a small stream, would likely result in mortality.

### **Summary of Chemical Risks and Effects**

Aerial fire retardant application rates are based on fire behavior, fuel models and fuel descriptions, and fire retardant is applied in front of an advancing fire. Fuel models are important to soils because they provide information on the amount and size class of live and dead vegetation available to intercept the fire retardant. When fire retardant is dropped on grass or brush, it has a greater live plant surface area to adhere to before coming in contact with the soil. For horizontally placed litter and slash, fire retardant movement to the soil is influenced by the depth and continuity of the material (Tome and Borrego 2002). For this reason, only a small percentage of fire retardant applied aerially reaches the soil surface. Retardant is unlikely to leach below the rooting zone, which can be 24-60" below ground level (Auxilio Management Services 2020, 2021a, 2021b, 2021c)

Based on a combination of the estimated risk of fire chemicals on wildlife, the relatively small amount of fire retardant actually used in wildland fire suppression activities (less than 1 percent of the land base), and the low likelihood for intrusions, the potential for negative effects to terrestrial species, amphibians, and aquatic invertebrates from the use of fire retardants by the Forest Service is expected, overall, to be low. These risks are small in scale; they are not likely to affect more than a few individuals or a portion of a population or habitat at any one time, and the retardant is not likely to have a lasting effect on most of the species. These effects are considered to be temporary or short-term in nature.

Small, endemic (or localized) populations with limited mobility or a specialized habitat may be affected by the aerial application of long-term fire retardant if directly hit. However, given the mobility of most species and their natural instinct to avoid a fire, direct application of retardants on wildlife species is expected to rarely occur. Instances where direct impacts from the application of retardant may occur more often is if nest trees/breeding sites are occupied at the time of the wildland fire incident or if the mobility of the individual species is such that it cannot avoid the area of application, such as with young individuals, aquatic invertebrates, or snails/slugs.

## Other Effects

Disturbance associated with low-flying aircraft can stress animals (disrupt calving, rearing, or nesting) or displace animals to areas of less suitable habitat. Although short in duration, this activity may cause a change in behavior for any wildlife that may be present or within the vicinity of the fire retardant drop. Disturbance by low flying aircraft may affect an area up to 1/2-mile from a breeding site, depending on the species [1,000 vertical feet for bald eagle (communal) nests (USFWS 2007); ¼-mile for California spotted owl nest (Gutierrez et al. 2017)] and location. Even those species with a moderate to high rate of mobility, who have the ability to escape the wildlife fire area, and are able to avoid direct drops of retardant, may be affected by the aircraft flying overhead or in the vicinity if individuals are roosting or nesting within approximately one mile.

A low, fast drop of a large load (2,500 gallons) of aerially applied fire retardant could negatively affect habitat by breaking off treetops or vegetation. Fire retardant drops could adversely affect components of breeding and rearing habitat either with a direct hit, thus covering vegetation, or by breaking vegetation necessary for nesting, foraging, or perching. However, the probability of this occurring to a nest tree in mature and old-growth habitat is highly unlikely, since the use of fire retardant in closed-canopy forests is not very effective, and therefore unlikely to be used.

Information on the effects of fire retardant chemicals on vegetation diversity is extremely limited. Similar to the effects of fertilizers, fire retardants may encourage growth of some plant species, including non-native, invasive species, giving them a competitive advantage over others, thus resulting in changes in community composition and species diversity. In a study cited in Auxilio Management Services (2020, 2021a, 2021b, 2021c), the effects of a retardant that is no longer commercially available (containing monoammonium phosphate and diammonium sulfate) was evaluated in a North Dakota grassland community and in a shrub steppe area in the Great Basin in Nevada. The researchers measured community characteristics, including species richness, evenness, diversity, and number of stems of woody and herbaceous plants.

In the North Dakota prairie ecosystem, species richness was reduced in plots exposed to retardant regardless of whether the plot was burned or unburned. All plots were dominated by *Poa pratensis* (Kentucky bluegrass), which clearly gained a competitive advantage from retardant application and crowded out other species.

Investigations in the Great Basin shrub steppe ecosystem also showed that plots treated with fire chemicals experienced initial declines in species richness; however, differences among plots were undetectable after a year. Depression of species richness was most pronounced in the riparian corridor.

Overall, vegetative community response to burning was more dramatic than was the response to chemical application. In both studies, the authors note that each study was short-term, and that long-term ecological responses should be measured over several growing seasons.

The use of aerial fire retardants may prevent more wildfires from becoming much larger and impacting more habitat for a particular species. Beneficial effects of using fire retardant may include the protection of habitat from burning by the prevention of large scale, stand replacing events in those area that are not adapted to larger fires. The use of avoidance area mapping is expected to minimize impacts caused by disturbance from the aerial delivery of fire retardant in

the vicinity of sensitive species populations that might be affected during a critical period of their life cycle, such as nesting, if the predominate fire season coincides with this life-cycle period.

## Potential Cumulative Effects Common to All Sensitive Species

The proposed action has the potential to result in a positive or negative cumulative effect to sensitive species viability or habitats, when combined with several past, present, and reasonably foreseeable natural and human-caused actions. These actions include habitat restoration and rehabilitation projects, habitat destruction from land development, recreational activities, natural disasters, such as hurricanes, climate change, grazing, timber harvesting, road construction and maintenance, mining, etc. Components of Forest Plans provide for protection and restoration as well as for wildlife species and habitats, including habitats for sensitive species.

As previously described, the use of aerial application of fire retardant is expected to have short-term effects. Additionally, the use of aerial application of fire retardant is expected to assist in preventing wildfires from increasing and consuming habitat for species.

The cumulative effect of aerial application on sensitive species is likely to be minor because of the small amount of area affected by retardant each year, spread widely across the United States (less than 1 percent of all National Forest System lands). Once a wildfire has burned through an area, the re-application to these same locations in the future is highly improbable due to the fact that fire and use of retardant would not occur due to low fuel loads. In other words, once a fire burns an area, it is highly improbable to burn at the same intensity, again, to cause the Forest Service to drop more retardant in that area. In addition, sensitive species located within retardant avoidance mapped areas would be protected from the effects of retardant. However, the amount of retardant could increase, decrease or stay the same depending on fire-fighting tactics used in the surrounding area. Establishing trigger points for restricting the use of retardants within watersheds where fire retardant has caused adverse effects to a species or population, and annual coordination should help reduce impacts to sensitive species and habitats. To summarize, avoidance area mapping for habitat and populations, establishing trigger points that restrict the use of retardants within watersheds where fire retardant has caused adverse effects to a species or population, and annual coordination should help reduce impacts to species and habitats.

Overall, the cumulative risk to most species is minor, with the exception of small, isolated, endemic populations. For species that are wide-ranging and have larger populations, aerial application of fire retardant on a specific fire would occur only within the habitat of a very small portion or fraction of a population; therefore, cumulative effects would be very minor.

## Analysis of Effects by Species Group

Appendix A lists Forest Service Sensitive Species by Region. There are no required avoidance areas for sensitive species. Under modified alternative 3, requirements for mapping or identifying aerial retardant avoidance areas include this direction:

- Map avoidance areas where aerial application of fire retardant may impact certain aquatic or terrestrial Regional Forester sensitive species or their habitat.
- Avoidance areas may be adjusted or established based on local conditions, including to comply with forest plan requirements such as those for Species of Conservation Concern



or to protect other biological or cultural resources. Avoidance area buffers around waterways may not be less than 300 feet on either side of a waterway in which water is present but may be increased where needed.

Avoidance areas that have been established for certain species listed under the Endangered Species Act may, in some cases, include habitat used by sensitive species. Information about federally listed species and avoidance areas associated with them is available in the project record.

Additional guidance for avoidance area mapping is found in the current implementation guide.

## **Puerto Rico Species**

All species which occur in the territory of Puerto Rico on the El Yunque National Forest will not be affected by the use of aerial application of fire retardant since fire retardant is not used on the island of Puerto Rico; therefore a No Impact determination has been made for these species and no further discussion or analysis will occur for these species since their habitat or populations will not be affected, either directly, indirectly, or cumulatively by the use of aerial application of fire retardant.

### **Group: Mammals**

Characterized by the presence of hair, mammary glands, warm blooded and give live birth, mammals may be found in all of the terrestrial habitat types and in every ecoregion. Eighty-nine mammalian species were analyzed for this project.

#### **Rodents**

These species consist of mice, vole, rats, prairie dogs, and squirrels, may be found in almost all of the terrestrial habitat types and in almost every ecoregion. Most of the small rodent species in this subgroup are fossorial in nature, spending the majority of their lives in burrows or underground dens.

Found throughout a variety of habitats and across the continent, these species have a higher probability of ingesting fire retardant chemicals since they are primarily herbivores. All long-term retardant products were predicted to pose a direct toxicity risk to small omnivores, as represented by deer mice, within the range of application rates (2 to 6 or more gallons per 100 square feet; table 6; Auxilio Management Services 2020) used by all Forest Service Regions (table 2). No direct toxicity risk was predicted for small herbivores, as represented by rabbits. Rodents tend to be well-distributed, but impacts to sensitive rodent species, particularly those associated with riparian or meadow habitat, may be reduced through avoidance area mapping.

#### **Bats**

Several species of bats use caves or mines for roosting and hibernacula; and any possible use of aerial application of fire retardant is not expected to have effects on caves serving as bat roosts and hibernacula. The biggest threat to cave roosting bats is human disturbance from people entering caves or mines during periods (generally winter) when bats are hibernating or roosting. Fire-fighting activities would not occur inside of caves where bats may roost. Most fire activity occurs in the warmer months outside the hibernating period. Aircraft flying over a cave containing a hibernacula or roost is not likely to cause disturbance. Avoidance mapping of occupied roost and hibernacula sites is possible if determined necessary by those National Forests

with these known sites. Forest Service Regions 8 and 9 have little or low potential use for aerial application of fire retardant.

With the exception of individual, non-volant, juvenile bats, effects to bat species from the use of aerial application of fire retardant are not expected since these species are highly mobile and able to avoid or flee areas with wildland fires (SCREEN 2). Except for sensitive bat species listed in most regions and the species found in Region 3, bats occur in areas/regions with low to moderate potential for the use of aerial retardant. However, a low, fast drop of 2,500 gallons of fire retardant does have the ability to break the tops off trees or knock weak snags over, thus having a small potential to cause some direct impacts to bats in general

During the summer and fall months when fires may occur, most bat species, including non-volant juveniles, can be found in the forest areas, roosting inside cavities in trees or snags, crevices in rock outcrops, or under loose bark on trees. Direct application is not expected to occur since bats would be protected by these features. During fall fires, when aerial fire retardant is expected to be used most often, juveniles have the ability to fly and escape areas where fire activity would be occurring. Given that some bats species may forage several miles from their roost sites and prey may also travel in from outside the retardant use area; only limited, short-term impacts would be expected.

#### **Carnivores and omnivores: mustelids/canids/felines/bears**

Carnivores are highly mobile species that are able to escape from areas with fire activities. The likelihood of a direct application from aerial application is extremely low due to high mobility and ability to escape the wildlife fire area as well as to avoid direct drops of retardant. However, low flying aircraft may cause short-term disturbance resulting in a small negative effect.

Based on coyotes, representing carnivores, no direct toxicity risk from aerial retardant to carnivores was predicted (Auxilio Management Services 2020, 2021a, 2021b, 2021c).

#### **Ungulates: sheep, deer and caribou**

Ungulates are highly mobile species that are able to escape from areas with fire activities. The direct impact from aerial drops of retardant on individuals is not expected; however impacts caused from a short-term disturbance of the individuals due to low-flying aircraft is expected to occur. The likelihood that bighorn sheep would be in an area where a retardant drop would occur is low or none because they typically inhabit steep, open terrain, where fire retardant would be of little or no use.

Based on deer, representing large herbivores and cows, representing ruminants, no direct toxicity risk from aerial retardant to these animal groups were predicted (Auxilio Management Services 2020, 2021a, 2021b, 2021c).

#### **Group: Birds**

Birds may be found in all of the aquatic and terrestrial habitat types and in every ecoregion. They are characterized by skin with feathers, hollow bones, and they lay eggs. One-hundred thirty bird species were analyzed for this project.

All bird species are highly mobile and able to escape from areas with wildland fire activities. The likelihood of direct application from aerial application is extremely low unless the species is still nesting or with young on the nest. Most impacts are caused by the use of low flying aircraft

which is expected to cause disturbance only for a very short time, usually a few minutes for a single day, thus having a small negative effect.

#### **Waterfowl, pelagic and shorebirds, included marsh and wetland species: ducks, rails, etc.**

This subgroup consists of birds that are dependent on large bodies of water or shorelines for the majority of their life cycle. With few exceptions, most of these birds occur in habitats where fire is not present (e.g., ocean, beaches, lakes, and marshes or wetlands), where the use of aerial application of fire retardant would not be effective, or in mapped avoidance areas (i.e., within 300 feet of waterways).

#### **Water/riparian dependent species: flycatchers, herons, etc.**

This subgroup consists of birds that use riparian areas for breeding, rearing, or foraging habitat. Avoidance area mapping within 300 feet of waterways, regardless of which Region the species occurs in, should avoid impacts to habitat consisting of breeding, rearing and shelter sites as well as foraging habitat for all of these species.

#### **Raptor species: hawks, falcons, birds of prey**

Species in this subgroup are known as birds of prey in that they actively hunt animals for food sources, with some feeding on carrion or dead animals. They occur in a variety of habitats including open prairie, mature and old growth forest, and mixed conifer-hardwood forests.

All raptors are highly mobile species that are able to escape from areas with fire activities, and the likelihood of a direct aerial application of retardant is extremely low unless the species is still nesting or still has young on the nest. Short-term disturbance, usually no more than a few minutes for a single day, from low-flying aircraft could lead to a small negative effect.

The individual salts of 5 retardant products were predicted to result in a direct toxicity risk to kestrels when applied at a rate of 6 gallons per 100 square feet or greater, which could primarily occur in Region 5 (California) or Region 10 (Alaska); a direct additive toxicity risk was predicted for 3 retardant products at application rates of 4 gallons per 100 square feet or greater (table 6, Auxilio Management Services 2020), which could include Regions 3, 4, 5, 6, and 10 (table 2).

#### **Forest associated: woodpeckers/songbird species**

Species in this subgroup occur in all forested habitat types and ecoregions. Forested habitats vary from open pine – oak savanna, hardwood, coniferous, or mixed species forests ranging in all seral stage types (seral stage is a function of age and stand structure).

All species are highly mobile species that are able to escape from areas with wildland fire activities, so the likelihood of direct aerial application is extremely low, unless the species is still nesting or still has young on the nest. Disturbance caused by the use of low flying aircraft is expected to last for only a very short time, usually a few minutes for a single day, thus having a small negative effect. In addition, a large load of several hundred gallons of retardant, dropped at a low flight altitude and relatively moderate rate of speed, could break the tops of trees which may remove nesting structures.

Similar to raptors, the individual salts of 5 retardant products were predicted to result in a direct toxicity risk to songbirds when applied at a rate of 6 gallons per 100 square feet or greater, which could primarily occur in Region 5 or Region 10. A direct additive toxicity risk was predicted for 3

retardant products at application rates of 3 gallons per 100 square feet. or greater (table 6, Auxilio Management Services 2020). This could occur in any Forest Service Regions, with the exception of Regions 8 and 9 (table 2).

**Upland/grassland associated: gallinaceous, cranes, herons, etc.**

Species in this subgroup occur in a variety of habitat types ranging from open grassland/prairies, scrub oak communities, to chaparral and into some forested habitat types and most ecoregions.

The likelihood of a direct application of aerial retardant is extremely low due to the high degree of mobility and ability of the species within this group to escape the wildlife fire area, unless nesting. A small, negative disturbance-based impact of up to a few minutes for a single day could be caused by low flying aircraft.

This subgroup occurs in the habitat type which has the highest probability for the use of aerial application of fire retardants. Scrub brush, chaparral, and grassland are the highest priority areas for retardant; these fuel types are best controlled with the aid of fire retardant due to the lack of over-story canopy closure which allows for the direct application of retardant onto the vegetation, thus increasing the effectiveness of the retardant (table 2).

Although birds from this group were not represented in the Risk Assessment (Auxilio Management Services 2020), we infer that direct toxicity effects would be similar to those of other bird groups for which there were represented (i.e., raptors and songbirds – see above). No toxicity risk was identified for bobwhite quail, representative of ground-nesting species, at the application rates used by the Forest Service.

**Desert/arid associated: cactus wren, etc.**

Most of the species in this subgroup occur in habitats where fire is not present, such as the Mojave and Sonoran deserts which consist mainly of sandy soils with arid plants that are widely spaced, where the use of aerial application of fire retardant would not be as effective.

**Group: Reptiles**

Characterized by skin with scales, cold blooded, and either lay eggs or give live birth, most reptiles are found in temperate, tropical, and desert habitats. They occur either in aquatic or terrestrial habitats and can be found throughout most of the nation. Forty-eight reptile species were analyzed.

Mobility or ability to avoid a wildland fire for reptilian species is limited due to their small size and small home range. These species tend to avoid wildland fires by retreating into their burrows or under rocks, etc. Some are associated with waterways and moist areas, such as garter snakes and most turtles. Semi-aquatic reptilian species are not expected to be directly affected due to the protection guidelines in place for waterways.

Direct effects of the fire retardants to individuals could include being hit by a retardant drop and ingestion of chemical residues on prey items.

For sensitive reptile species occurring in areas with moderate to high potential for aerial retardant use (Regions 3, 4, and 5), there may be a negative direct toxicity effect from prey species that have consumed vegetation covered with retardant (rodents); (Auxilio Management Services 2020;

deer mouse toxicity – see above); however, direct toxicity to reptiles by prey burden was not specifically addressed by the Risk Assessment.

Most sensitive reptile species have low distribution and population size, thus terrestrial avoidance area mapping applied for these sites on Forests with moderate to high potential for aerial retardant use may minimize impacts to these species.

## **Group: Amphibians**

Amphibians consist of frogs and salamanders. Some are totally aquatic; some are semi-aquatic; and some are terrestrial but live in semi-moist environments. They are cold blooded, lay eggs, and require a moist or aquatic habitat for reproduction. Sixty-six amphibian species were analyzed.

Tadpole was the only amphibian life stage assessed for direct toxicity by Auxilio Management Services (2020, 2021a, 2021b, 2021c). Phos-Chek MVP-Fx could result in acute toxicity to tadpoles when accidentally applied across a small stream at 6 gallons per 100 square feet or greater (table 6, which primarily coincides with application rates in Regions 5 and 10. However, intrusions are rare and required Avoidance Area Mapping of aquatic waterways (regardless of which Region the species occurs in) should avoid most impacts to breeding, rearing and shelter sites for all aquatic-dependent species and tadpole life stage of all species.

For terrestrial amphibian species: Avoidance Area Mapping (regardless of which Region the species occurs in) may minimize impacts to habitat, including breeding, rearing and shelter sites for all of these species.

Most sensitive amphibian species have low distribution and population size. Therefore, terrestrial avoidance area mapping applied to sites on forests with moderate to high potential for aerial retardant may minimize impacts to these species. Even then, there would be a low likelihood of direct impact from an aerial retardant intrusion because species mobility is limited by small size and small home range.

## **Group: Invertebrates**

This group contains spiders, insects, mussels, snails, slugs, and allies. Five-hundred sixty-five species are included in this group.

### **Arachnids – spiders**

The habitats occupied by these species are dependent on high moisture regimes. The effects of a fire in these areas would be devastating to the species. It is possible that the use of fire retardant would be recommended to protect known and suitable habitats for spider species to avoid catastrophic loss of either species and/or their habitat. Therefore, while there could be adverse effects to the species from the use of fire retardant (though the effects of aerial retardants on arachnids have not been studied), the use of retardant (that would only affect a portion of the occupied habitat for a short duration of time) would be justified to protect the remainder of the habitat from the known detrimental effects of fire.

The primary direct effects on spiders could include physical injury or death resulting from the force of the retardant hitting them, as well as impacts from physical changes in sensitive habitats and chemical changes in the environment (pH, phosphorous, nitrogen, etc.) The likelihood of spiders being killed by the force of retardant hitting them or their habitat is minimal.

### **Insects: butterflies and beetles, etc.**

Most of the species in this subgroup are limited in distribution and occur in habitats where a host plant must be present for the larvae stages of their life cycle. They occur in several ecoregions and have complex lifecycles that may take up to 2-3 years for larvae to mature to adults, which may live only for a few months. The effects of fire retardant are likely influenced by the season of use and associated life-stage of the insect, canopy cover at the retardant drop site, retardant application rates and coverages, and the population density of the species.

Specific to butterflies, the effects of the aerial application of fire retardants can be manifested as a toxicity issue and as physical hazard issue. Few studies have been conducted to determine the effects of fire retardant chemicals on terrestrial invertebrates. Direct physical hazards expected from the aerial application of fire retardant may result in some level of misting or coating of individuals, which may potentially kill adults, larvae, and pupae due to the effective sticky covering of the retardant itself rendering the animal immobilized, or possibly suffocating the individual and thus affecting its survival.

Data on the potential toxicity of fire retardants to larvae of sensitive invertebrates are lacking (Auxilio Management Services 2020, 2021a, 2021b, 2021c), although the risk assessment states that the incidence of galling insects (wasps, beetles, aphids, and flies) were not affected by treatment with the retardant applied at a rate of 3 gallons per 100 square feet in a study in Great Basin shrub steppe vegetation in northern Nevada. Indirect fertilizing effects of retardants on vegetation could benefit host plants both by protecting them from the flame front and providing additional nutrients. Conversely, it could promote non-native species colonization into important host plant habitats in highly disturbed areas.

### **Insects: Aquatic Insects**

Some insect orders contain only species that are aquatic in some life stages (e.g., mayflies, stoneflies, dragonflies, caddisflies, megalopterans), whereas other orders contain both aquatic and terrestrial species (e.g., beetles, bugs, butterflies, neuropterans, orthopterans, and dipterans). Aquatic insects are abundant in most freshwater habitats and often exhibit high diversity. They play significant roles in freshwater ecosystems, including serving as food items for many vertebrate and invertebrate predators found in aquatic systems.

Although aquatic insects were not specifically analyzed by Auxilio Management Services (2020, 2021a, 2021b, 2021c) for acute toxicity from aerial retardants, the salts, pigment ingredients, and additive effect of several qualified retardant products can result in acute toxicity to aquatic invertebrates, as represented by *Daphnia magna*, when accidentally applied across a small stream at application rates ranging from 1 – 6 or greater gallons per 100 square feet (table 6), which essentially could occur anywhere Forest Service-wide (table 2). An acute toxicity response was predicted from one product, Phos-Chek LCE20-Fx (table 5), when accidentally applied across a large stream at an application rate of 6 gallons per 100 square feet or greater (Region 5; table 2)

However, intrusions are rare and required avoidance of aquatic waterways (regardless of which Region the species occurs in) should avoid most impacts to aquatic invertebrates, including aquatic insects.

### **Molluscs (Bivalves and Gastropods) and Worms**

The subgroup called molluscs is comprised of mussels, snails and slugs. Some are totally aquatic, some are semi-aquatic, and some are terrestrial but live in semi-moist environments, usually

under thick brush or tree canopies and in deep litter layers or under rocks with moss. Most federally listed mollusc species have low distribution and population size, and avoidance area mapping was recommended for these sites in 2011 in order to minimize impacts to species occurring on Forests with moderate to high potential for aerial retardant use. This could afford protections to sympatric sensitive mollusc species. There is a slight likelihood of direct effects since this species mobility is limited due to their small size and small home range, thus they may not be able to avoid the area of a retardant drop.

The habitats occupied by most of these species are dependent on high moisture regimes and are not typically vulnerable to wildfires. Most occur in riparian or north facing aspects where moisture regimes are higher than the surrounding areas. However, the effects of a fire in these areas would be devastating to the species. It is possible that the use of fire retardant would be recommended to protect known and suitable habitats to avoid catastrophic loss of either species and/or their habitats. Worms in this grouping utilize terrestrial habitats. Fire retardant movement to the soil is influenced by the depth and continuity of the material (Tome and Borrego 2002), and due to vegetative surfaces, only a small percentage of fire retardant applied aerially reaches the soil surface. Although retardant is unlikely to leach below the rooting zone, which can be 24-60” below ground level (Auxilio Management Services 2020, 2021a, 2021b, 2021c), this zone may provide habitat for some earthworm species (Washington Department of Fish and Wildlife 2020).

Using very conservative assumptions, two products (Phos-Chek 259-Fx and Phos-Chek LCE20-Fx) may pose risks of sublethal effects (survival and reproduction) from long-term exposures to ammonia for bivalves (see above). Avoidance Area mapping may be applied due to the limited distribution of species for those forests that determine this mitigation is appropriate. For mussels, an accidental spill of concentrated or mixed retardant, particularly in a small stream, would likely result in mortality. However, the probability of an accidental spill is extremely small due to spill containment standard operating procedures and contract language to prevent such at air tanker bases and mobile retardant bases, respectively.

## Crustaceans

The crustacean subgroup includes amphipods, copepods, isopods, ostracods, and crayfish. As with molluscs, some are totally aquatic, some are semi-aquatic, and some are terrestrial but live in semi-moist environments.

Although crustaceans were not specifically analyzed by Auxilio Management Services (2020, 2021a, 2021b, 2021c) for acute toxicity from aerial retardants, the salts, pigment ingredients, and additive effect of several qualified retardant products can result in acute toxicity to aquatic invertebrates, as represented by *Daphnia magna*, when accidentally applied across a small stream at application rates ranging from 1 – 6 or greater gallons per 100 square feet (table 6), which essentially could occur anywhere Forest Service-wide (table 2). An acute toxicity response was predicted from one product, Phos-Chek LCE20-Fx (table 5), when accidentally applied across a large stream at an application rate of 6 gallons per 100 square feet or greater (Region 5; table 2).

However, intrusions are rare and required avoidance of aquatic waterways (regardless of which Region the species occurs in) should avoid most impacts to aquatic invertebrates, including crustaceans.

## Group: Fish

Fish can be found in all aquatic habitats in all ecoregions. One-hundred fifty-nine species were analyzed.

The ecological risk assessment (Auxilio Management Service 2021a, 2021b, 2021c) analyzed the risks from runoff, the risks from application across a small or large stream, and the risk from accidental spills into streams. There were no risks identified to aquatic species from runoff into streams after application of mixed retardant products. An application of Phos-Chek LCE20-Fx across a large stream (147,200-acre basin with 350-cubic-feet-per-second flow) posed a risk to species represented by *Daphnia magna*. Applications of Phos-Chek LCE20-Fx, Phos-Chek MVP-Fx, Phos-Chek 259-Fx, Phos-Chek LC-95A-Fx, and Fortress FR-100 across a small stream. Accidental application across a small stream was found for species represented by rainbow trout for all analyzed retardants except Fortress FR-200 LLX.

However, intrusions are rare and required avoidance of aquatic waterways (regardless of which Region the species occurs in) should avoid most impacts to fish and their prey.

## Summary of Determinations

For the 1058 Forest Service sensitive wildlife species, the unit specific determinations are:

- 989 species occurrences with No Impacts due to no retardant use or not in habitat where fire retardant would be used.
- 2,131 species occurrences have a May Impact Individuals or Habitat determinations.
- 0 sensitive species occurrences that have a potential risk to be trending towards listing with use of aerial application of fire retardant.

Appendix D lists the determinations for each species by region and unit.



## References Cited

- Anderson. 1982. Hal E. Anderson April 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. General Technical Report INT-122, USDA Forest Service, Intermountain Forest and Range Experimental Station, Ogden, Utah 84401. Order Number NFES 1574, PMS 435-1. 22pp.
- Auxilio Management Services. 2020. Ecological risk assessment of wildland fire-fighting chemicals: long term fire retardants. Prepared for Fire and Aviation Management & National Technology and Development Program, U.S. Forest Service, Missoula, MT.
- Auxilio Management Services. 2021a. Ecological risk assessment of wildland fire-fighting chemicals: long term fire retardants. Prepared for Fire and Aviation Management & National Technology and Development Program, U.S. Forest Service, Missoula, MT. May. 86 pages.
- Auxilio Management Services. 2021b. Ecological risk assessment of wildland fire-fighting chemicals: long term fire retardants. Prepared for Fire and Aviation Management & National Technology and Development Program, U.S. Forest Service, Missoula, MT. June. 86 pages.
- Auxilio Management Services. 2021c. Ecological risk assessment of wildland fire-fighting chemicals: long term fire retardants. Prepared for Fire and Aviation Management & National Technology and Development Program, U.S. Forest Service, Missoula, MT. November. 90 pages.
- Bailey, R.G. 1995. Description of the ecoregions of the United States. 2d ed., rev.. Misc. Publ. No. 1391(rev.). Washington, DC: U.S. Department of Agriculture, Forest Service. 108 p. <https://www.fs.fed.us/land/ecosysgmt/> .
- Cooperrider et al 1986. Cooperrider, A.Y., R.J. Boyd, and H.R. Stuart, eds. 1986. Inventory and Monitoring of Wildlife Habitats. USDI Bureau of Land Management Service Center, Denver, CO. 858 pp.
- Geier-Hayes, Kathleen. 2011. Fire Ecology Specialist Report for Aerial Application of Fire Retardant Draft EIS
- Gutiérrez, R.J.; Manley, Patricia N.; Stine, Peter A., tech. eds. 2017. The California spotted owl: current state of knowledge. Gen. Tech. Rep. PSW-GTR-254. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 294 p.
- NatureServe. 2020. NatureServe Explorer [2.0]. NatureServe, Arlington, Virginia. Available <https://explorer.natureserve.org/>. (Accessed: 2020).
- Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

- Tome, M. and C. Borrego. 2002. Fighting wildfires with retardants applied with airplanes. Forest Fire Research & Wildland Fire Safety, Viegas (ed.) ISBN 90-77017-72-0.
- United States Department of Agriculture, Forest Service. 2010. USFS National List of TEP Species by Region, WO 10/2010.
- United States Department of Agriculture, Forest Service. 2011e. Nation-wide Aerial Application of Fire Retardant on National Forest System Lands: Wildlife Report and Biological Evaluation. October. 145 pages.
- United States Department of Agriculture, Forest Service. 2020a. Nationwide Aerial Application of Fire Retardant on National Forest System Lands: Supplemental Information Report. Fire and Aviation Management, Washington, D.C. May. 25 pages.
- United States Department of Agriculture, Forest Service. 2020b. Specification 5100-304d. Long-Term Retardant, Wildland Firefighting. [https://www.fs.usda.gov/rm/fire/wfcs/documents/5100-304d\\_LTR\\_Final\\_010720\\_with%20Amendment%201.pdf](https://www.fs.usda.gov/rm/fire/wfcs/documents/5100-304d_LTR_Final_010720_with%20Amendment%201.pdf). 32 pages
- United States Department of Agriculture, Forest Service. 2021c. Nationwide Aerial Application of Fire Retardant on National Forest System Land Biological Assessment for Fish and Wildlife Service Species. Fire and Aviation Management, Washington, D.C. November. 391 pages.
- United States Department of Interior, Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. Accessed: [https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines\\_0.pdf](https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf). May. 25 pages.
- Washington Department of Fish and Wildlife (WDFW). 2020. Giant Palouse earthworm description and range. Available online: <https://wdfw.wa.gov/species-habitats/species/driloleirus-americanus#desc-range>. Accessed 11/03/2020.
- Zylstra, S. 2010. Summary of Fire Retardant used by Region and Fire Chemical Intrusions into Waterways, Buffer Zones and Threatened and Endangered Species Habitat, 2008-2009. Unpublished report.

## Appendix A: Regional Forester Sensitive Species Lists

| Category  | Common Name                              | Scientific Name                         | Regions found |
|-----------|--|---|---------------|
| amphibian | Jefferson salamander                     | <i>Ambystoma jeffersonianum</i>         | 9             |
| amphibian | blue-spotted salamander                  | <i>Ambystoma laterale</i>               | 9             |
| amphibian | boreal toad                              | <i>Anaxyrus boreas boreas</i>           | 2, 4          |
| amphibian | green salamander                         | <i>Aneides aeneus</i>                   | 8, 9          |
| amphibian | Sacramento Mountains salamander          | <i>Aneides hardii</i>                   | 3             |
| amphibian | black salamander                         | <i>Aneides flavipunctatus</i>           | 6             |
| amphibian | Rocky Mountain tailed frog               | <i>Ascaphus montanus</i>                | 6             |
| amphibian | Fairview slender salamander              | <i>Batrachoseps bramei</i>              | 5             |
| amphibian | San Gabriel Mountains slender salamander | <i>Batrachospes gabrieli</i>            | 5             |
| amphibian | San Simeon slender salamander            | <i>Batrachoseps incognitus</i>          | 5             |
| amphibian | lesser slender salamander                | <i>Batrachoseps minor</i>               | 5             |
| amphibian | relictual slender salamander             | <i>Batrachoseps relictus</i>            | 5             |
| amphibian | Kern Canyon slender salamander           | <i>Batrachoseps simatus</i>             | 5             |
| amphibian | western toad                             | <i>Bufo boreas</i>                      | 1             |
| amphibian | great plains toad                        | <i>Bufo cognatus</i>                    | 1             |
| amphibian | western barking frog                     | <i>Craugastor augusti cactorum</i>      | 3             |
| amphibian | hellbender salamander                    | <i>Cryptobranchus alleganiensis</i>     | 8, 9          |
| amphibian | Apalachicola dusky salamander            | <i>Desmognathus apalachicola</i>        | 8             |
| amphibian | dwarf black-bellied salamander           | <i>Desmognathus folkertsi</i>           | 8             |
| amphibian | northern pygmy salamander                | <i>Desmognathus organi</i>              | 8             |
| amphibian | Cope's giant salamander                  | <i>Dicamptodon copei</i>                | 5             |
| amphibian | yellow-blotched salamander               | <i>Ensatina eschscholtzii croceater</i> | 5             |
| amphibian | large-blotched salamander                | <i>Ensatina eschscholtzii klauberi</i>  | 5             |
| amphibian | easter narrow-mouth toad                 | <i>Gastrophryne carolinensis</i>        | 9             |
| amphibian | four-toed salamander                     | <i>Hemidactylium scutatum</i>           | 9             |
| amphibian | limestone salamander                     | <i>Hydromantes brunus</i>               | 5             |
| amphibian | Shasta salamander                        | <i>Hydromantes shastae</i>              | 5             |
| amphibian | bird-voiced treefrog                     | <i>Hyla avivoca</i>                     | 9             |
| amphibian | crawfish frog                            | <i>Lithobates areolatus</i>             | 8             |
| amphibian | plains leopard frog                      | <i>Lithobates blairi</i>                | 2, 9          |
| amphibian | gopher frog                              | <i>Lithobates capito</i>                | 8             |
| amphibian | northern leopard frog                    | <i>Lithobates pipiens</i>               | 2, 3, 6       |
| amphibian | wood frog                                | <i>Lithobates sylvatica</i>             | 2             |
| amphibian | Tarahumara frog                          | <i>Lithobates tarahumarae</i>           | 3             |
| amphibian | lowland leopard frog                     | <i>Lithobates yavapaiensis</i>          | 3             |
| amphibian | mudpuppy                                 | <i>Necturus maculosus</i>               | 9             |
| amphibian | striped newt                             | <i>Notophthalmus perstriatus</i>        | 8             |
| amphibian | Caddo Mountain salamander                | <i>Plethodon caddoensis</i>             | 8             |
| amphibian | Chattahoochee slimy salamander           | <i>Plethodon chattahoochee</i>          | 8             |

| Category  | Common Name                         | Scientific Name                         | Regions found    |
|-----------|-------------------------------------|---|------------------|
| amphibian | Cheoah bald salamander              | <i>Plethodon cheoah</i>                 | 8                |
| amphibian | Fourche Mountain salamander         | <i>Plethodon fourchensis</i>            | 8                |
| amphibian | Peaks of Otter salamander           | <i>Plethodon hubrichti</i>              | 8                |
| amphibian | Cour d'Alene salamander             | <i>Plethodon idahoensis</i>             | 1                |
| amphibian | Kiamichi slimy salamander           | <i>Plethodon kiamichi</i>               | 8                |
| amphibian | Louisiana slimy salamander          | <i>Plethodon kisatchie</i>              | 8                |
| amphibian | Larch Mountain salamander           | <i>Plethodon larselli</i>               | 6                |
| amphibian | Rich Mountain salamander            | <i>Plethodon ouachitae</i>              | 8                |
| amphibian | Cow Knob salamander                 | <i>Plethodon punctatus</i>              | 8                |
| amphibian | Sequoia slimy salamander            | <i>Plethodon sequoyah</i>               | 8                |
| amphibian | Big Levels salamander               | <i>Plethodon sherando</i>               | 8                |
| amphibian | Siskiyou Mountain salamander        | <i>Plethodon stormi</i>                 | 5, 6             |
| amphibian | Van Dyke's salamander               | <i>Plethodon vandykei</i>               | 6                |
| amphibian | Shenandoah Mountain salamander      | <i>Plethodon virginia</i>               | 8                |
| amphibian | Webster's salamander                | <i>Plethodon websteri</i>               | 8                |
| amphibian | Weller's salamander                 | <i>Plethodon welleri</i>                | 8                |
| amphibian | Illinois chorus frog                | <i>Pseudacris streckeri illinoensis</i> | 9                |
| amphibian | northern red-legged frog            | <i>Rana aurora</i>                      | 5                |
| amphibian | mud salamander                      | <i>Pseudotriton montanus</i>            | 9                |
| amphibian | foothill yellow-legged frog         | <i>Rana boylei</i>                      | 6                |
| amphibian | Cascade frog                        | <i>Rana cascadae</i>                    | 5                |
| amphibian | Columbia spotted frog               | <i>Rana luteiventris</i>                | 2, 4, 6          |
| amphibian | northern leopard frog               | <i>Rana pipiens</i>                     | 1                |
| amphibian | Cascade torrent salamander          | <i>Rhyacotriton cascadae</i>            | 6                |
| amphibian | Olympic torrent salamander          | <i>Rhyacotriton olympicus</i>           | 6                |
| amphibian | southern torrent salamander         | <i>Rhyacotriton variegatus</i>          | 5                |
| amphibian | patch-nosed salamander              | <i>Urseleperes brucei</i>               | 8                |
| annelid   | giant Palouse earthworm             | <i>Driloleirus americanus</i>           | 6                |
| arachnid  | southeastern wandering spider       | <i>Anahita punctulate</i>               | 9                |
| arachnid  | a pseudoscorpion                    | <i>Apochthonius indianensis</i>         | 9                |
| arachnid  | Dry Fork Valley Cave pseudoscorpion | <i>Apochthonius paucispinosus</i>       | 9                |
| arachnid  | a cave obligate harvestman          | <i>Erebomaster flavescens</i>           | 9                |
| arachnid  | southeastern cave pseudoscorpion    | <i>Hesperochnes mirabilis</i>           | 9                |
| arachnid  | gray-handed pseudoscorpion          | <i>Kleptochthonius griseomanus</i>      | 9                |
| arachnid  | a cave obligate pseudoscorpion      | <i>Kleptochthonius packardi</i>         | 9                |
| arachnid  | a cave spider                       | <i>Nesticus carteri</i>                 | 9                |
| arachnid  | Beatty's Cave sheet-web spider      | <i>Oreonetides beattyi</i>              | 9                |
| arachnid  | Appalachian Cave spider             | <i>Porrhomma cavernicola</i>            | 9                |
| arachnid  | a gnaphosid spider                  | <i>Talanites exlineae</i>               | 9                |
| arachnid  | a cave obligate pseudoscorpion      | <i>Tuberochnes ubicki</i>               | 3                |
| bird      | northern goshawk                    | <i>Accipiter gentilis</i>               | 2, 3, 4, 5, 6, 9 |
| bird      | Queen Charlotte goshawk             | <i>Accipiter gentilis laingi</i>        | 10               |
| bird      | Clark's grebe                       | <i>Aechmophorus clarkia</i>             | 6                |
| bird      | boreal owl                          | <i>Aegolius funereus</i>                | 2, 4, 9          |

| Category | Common Name                   | Scientific Name                                     | Regions found |
|----------|-------------------------------|---|---------------|
| bird     | tricolored blackbird          | <i>Agelaius tricolor</i>                            | 6             |
| bird     | violet-crowned hummingbird    | <i>Amazilia violiceps</i>                           | 3             |
| bird     | Baird's sparrow               | <i>Ammodramus bairdii</i>                           | 1, 3          |
| bird     | Henslow's sparrow             | <i>Ammodramus henslowii</i>                         | 8, 9          |
| bird     | Le Conte's sparrow            | <i>Ammodramus lecoontei</i>                         | 9             |
| bird     | Nelson's sparrow              | <i>Ammodramus nelsoni</i>                           | 9             |
| bird     | grasshopper sparrow           | <i>Ammodramus savannarum</i>                        | 2, 6, 9       |
| bird     | Arizona grasshopper sparrow   | <i>Ammodramus savannarum ammolegus</i>              | 3             |
| bird     | tule goose                    | <i>Anser albifrons elgasi</i>                       | 6             |
| bird     | Sprague's pipit               | <i>Anthus spragueii</i>                             | 1             |
| bird     | sagebrush sparrow             | <i>Artemisiospiza nevadensis</i>                    | 2             |
| bird     | short-eared owl               | <i>Asio flammeus</i>                                | 2, 9          |
| bird     | long-eared owl                | <i>Asio otus</i>                                    | 9             |
| bird     | burrowing owl                 | <i>Athene cunicularia</i>                           | 1, 2, 3       |
| bird     | upland sandpiper              | <i>Bartramia longicauda</i>                         | 6, 9          |
| bird     | ruffed grouse                 | <i>Bonasa umbellus</i>                              | 9             |
| bird     | American bittern              | <i>Botaurus lentiginosus</i>                        | 2, 9          |
| bird     | Kittlitz's murrelet           | <i>Brachyramphus brevirostris</i>                   | 10            |
| bird     | bufflehead                    | <i>Bucephala albeola</i>                            | 6             |
| bird     | red-shouldered hawk           | <i>Buteo lineatus</i>                               | 9             |
| bird     | ferruginous hawk              | <i>Buteo regalis</i>                                | 2, 6          |
| bird     | common black hawk             | <i>Buteogallus anthracinus</i>                      | 3             |
| bird     | chestnut-collared longspur    | <i>Calcarius ornatus</i>                            | 2             |
| bird     | lucifer hummingbird           | <i>Calothorax lucifer</i>                           | 3             |
| bird     | Costa's hummingbird           | <i>Calypte costae</i>                               | 3             |
| bird     | northern beardless-tyrannulet | <i>Camptostoma imberbe</i>                          | 3             |
| bird     | San Diego cactus wren         | <i>Campylorhynchus brunneicapillus sandiegensis</i> | 5             |
| bird     | buff-collared nightjar        | <i>Caprimulgus ridgwayi</i>                         | 3             |
| bird     | whip-poor-will                | <i>Caprimulgus vociferous</i>                       | 9             |
| bird     | lesser goldfinch              | <i>Carduelis psaltria</i>                           | 6             |
| bird     | Bicknell's thrush             | <i>Catharus bicknelli</i>                           | 9             |
| bird     | Swainson's thrush             | <i>Catharus ustulatus</i>                           | 9             |
| bird     | greater sage grouse           | <i>Centrocercus urophasianus</i>                    | 1, 2, 4, 5, 6 |
| bird     | mountain plover               | <i>Charadrius montanus</i>                          | 2             |
| bird     | black tern                    | <i>Chlidonias niger</i>                             | 2, 9          |
| bird     | northern harrier              | <i>Circus cyaneus</i>                               | 2, 9          |
| bird     | black-billed cuckoo           | <i>Coccyzus erythrophthalmus</i>                    | 9             |
| bird     | northern bobwhite             | <i>Colinus virginianus</i>                          | 9             |
| bird     | common ground dove            | <i>Columbina passerine</i>                          | 3             |
| bird     | olive-sided flycatcher        | <i>Contopus cooperi</i>                             | 2, 9          |
| bird     | yellow rail                   | <i>Coturnicops noveboracensis</i>                   | 5, 6, 9       |
| bird     | trumpeter swan                | <i>Cygnus buccinator</i>                            | 1, 2, 4, 6, 9 |
| bird     | broad-billed hummingbird      | <i>Cynanthus latirostris</i>                        | 3             |

| Category | Common Name                  | Scientific Name                        | Regions found    |
|----------|------------------------------|--|------------------|
| bird     | black swift                  | <i>Cypseloides niger</i>               | 1, 2, 6          |
| bird     | bobolink                     | <i>Dolichonyx oryzivorus</i>           | 6, 9             |
| bird     | gray catbird                 | <i>Dumetella carolinensis</i>          | 3                |
| bird     | buff-breasted flycatcher     | <i>Empidonax fulvifrons</i>            | 3                |
| bird     | willow flycatcher            | <i>Empidonax trailii</i>               | 5                |
| bird     | gray flycatcher              | <i>Empidonax wrightii</i>              | 6                |
| bird     | eared quetzal                | <i>Euptilotis neoxenus</i>             | 3                |
| bird     | rusty blackbird              | <i>Euphagus carolinus</i>              | 9                |
| bird     | spruce grouse                | <i>Falcapennis canadensis</i>          | 9                |
| bird     | American peregrine falcon    | <i>Falco peregrinus anatum</i>         | 1, 3, 4, 9       |
| bird     | common gallinule             | <i>Gallinula galeata</i>               | 9                |
| bird     | common loon                  | <i>Gavia immer</i>                     | 1, 4, 6, 9       |
| bird     | cactus ferruginous pygmy owl | <i>Glaucidium brasilianum cactorum</i> | 3                |
| bird     | sandhill crane               | <i>Grus canadensis</i>                 | 6                |
| bird     | Florida sandhill crane       | <i>Grus canadensis pratensis</i>       | 8                |
| bird     | greater sandhill crane       | <i>Grus canadensis tabida</i>          | 5                |
| bird     | bald eagle                   | <i>Haliaeetus leucocephalus</i>        | 1, 3, 4, 5, 6, 9 |
| bird     | black oystercatcher          | <i>Haematopus bachmani</i>             | 10               |
| bird     | harlequin duck               | <i>Histrionicus histrionicus</i>       | 1, 2, 4, 6       |
| bird     | Caspian tern                 | <i>Hydroprogne caspia</i>              | 9                |
| bird     | white-eared hummingbird      | <i>Hylocharis leucotis</i>             | 3                |
| bird     | least bittern                | <i>Ixobrychus exilis</i>               | 9                |
| bird     | yellow-eyed junco            | <i>Junco phaeonotus</i>                | 3                |
| bird     | white-tailed ptarmigan       | <i>Lagopus leucura</i>                 | 2                |
| bird     | loggerhead shrike            | <i>Lanius ludovicianus</i>             | 1, 2             |
| bird     | migrant loggerhead shrike    | <i>Lanius ludovicianus migrans</i>     | 9                |
| bird     | black rosy finch             | <i>Leucosticte atrata</i>              | 6                |
| bird     | Wallowa rosy finch           | <i>Leucosticte tephrocotis wallowa</i> | 6                |
| bird     | Swainson's warbler           | <i>Limnothlupis swainsonii</i>         | 9                |
| bird     | whiskered screech owl        | <i>Megascops trichopsis</i>            | 3                |
| bird     | red-headed woodpecker        | <i>Melanerpes erythrocephalus</i>      | 9                |
| bird     | acorn woodpecker             | <i>Melanerpes formicivorus</i>         | 6                |
| bird     | Lewis' woodpecker            | <i>Melanerpes lewis</i>                | 2, 6             |
| bird     | gila woodpecker              | <i>Melanerpes uropygialis</i>          | 3                |
| bird     | Gould's wild turkey          | <i>Meleagris gallopavo mexicana</i>    | 3                |
| bird     | Abert's towhee               | <i>Melospiza aberti</i>                | 3                |
| bird     | ash-throated flycatcher      | <i>Myiarchus cinerascens</i>           | 6                |
| bird     | sulphur-bellied flycatcher   | <i>Myioodynastes luteiventris</i>      | 3                |
| bird     | long-billed curlew           | <i>Numenius americanus</i>             | 1, 2, 6          |
| bird     | Connecticut warbler          | <i>Oporornis agilis</i>                | 9                |
| bird     | mountain quail               | <i>Oreortyx pictus</i>                 | 1, 4, 6          |
| bird     | Nashville warbler            | <i>Oreothlypis ruficapilla</i>         | 9                |
| bird     | flamulated owl               | <i>Otus flammeolus</i>                 | 1                |

| Category | Common Name                    | Scientific Name                             | Regions found |
|----------|--------------------------------|---|---------------|
| bird     | rose-throated becard           | <i>Pachyramphus aglaiae</i>                 | 3             |
| bird     | osprey                         | <i>Pandion haliaetus</i>                    | 9             |
| bird     | Louisiana waterthrush          | <i>Parkesia motacilla</i>                   | 9             |
| bird     | northern waterthrush           | <i>Parkesia noveboracensis</i>              | 6, 9          |
| bird     | varied bunting                 | <i>Passerina versicolor</i>                 | 3             |
| bird     | American white pelican         | <i>Pelecanus erythrorhynchos</i>            | 6             |
| bird     | brown pelican                  | <i>Pelecanus occidentalis</i>               | 5, 6          |
| bird     | Bachman's sparrow              | <i>Peucaea aestivalis</i>                   | 8, 9          |
| bird     | Cassin's sparrow               | <i>Peucaea cassinii</i>                     | 2             |
| bird     | Wilson's phalarope             | <i>Phalaropus tricolor</i>                  | 9             |
| bird     | white-headed woodpecker        | <i>Picoides albolarvatus</i>                | 1, 4, 6       |
| bird     | black-backed woodpecker        | <i>Picoides arcticus</i>                    | 1, 2, 9       |
| bird     | American three-toed woodpecker | <i>Picoides dorsalis</i>                    | 9             |
| bird     | Arizona woodpecker             | <i>Picoides arizonae</i>                    | 3             |
| bird     | three-toed woodpecker          | <i>Picoides tridactylus</i>                 | 4             |
| bird     | green-tailed towhee            | <i>Pipilo chlorurus</i>                     | 6             |
| bird     | horned grebe                   | <i>Podiceps auritus</i>                     | 6             |
| bird     | red-necked grebe               | <i>Podiceps grisegena</i>                   | 6             |
| bird     | piebilled grebe                | <i>Podilymbus podiceps</i>                  | 9             |
| bird     | vesper sparrow                 | <i>Pooecetes gramineus</i>                  | 9             |
| bird     | purple martin                  | <i>Progne subis</i>                         | 2, 6          |
| bird     | flammulated owl                | <i>Psilosops flammeolus</i>                 | 2, 4          |
| bird     | king rail                      | <i>Rallus elegans</i>                       | 9             |
| bird     | McCown's longspur              | <i>Rhynchophanes mccownii</i>               | 2             |
| bird     | American woodcock              | <i>Scolopax minor</i>                       | 9             |
| bird     | cerulean warbler               | <i>Setophaga cerulea</i>                    | 9             |
| bird     | prairie warbler                | <i>Setophaga discolor</i>                   | 9             |
| bird     | pygmy nuthatch                 | <i>Sitta pygmaea</i>                        | 1             |
| bird     | Brewer's sparrow               | <i>Spizella breweri</i>                     | 2             |
| bird     | clay-colored sparrow           | <i>Spizella pallida</i>                     | 9             |
| bird     | Aleutian tern                  | <i>Sterna aleutica</i>                      | 10            |
| bird     | common tern                    | <i>Sterna hirundo</i>                       | 9             |
| bird     | great gray owl                 | <i>Strix nebulosa</i>                       | 4, 5, 6, 9    |
| bird     | California spotted owl         | <i>Strix occidentalis occidentalis</i>      | 4, 5          |
| bird     | elegant trogon                 | <i>Trogon elegans</i>                       | 3             |
| bird     | greater prairie chicken        | <i>Tympanuchus cupido</i>                   | 1, 2          |
| bird     | lesser prairie chicken         | <i>Tympanuchus pallidicinctus</i>           | 2             |
| bird     | sharp-tailed grouse            | <i>Tympanuchus phasianellus</i>             | 6, 9          |
| bird     | Columbian sharp-tailed grouse  | <i>Tympanuchus phasianellus columbianus</i> | 2, 4, 6       |
| bird     | thick-billed kingbird          | <i>Tyrannus crassirostris</i>               | 3             |
| bird     | barn owl                       | <i>Tyto alba</i>                            | 9             |
| bird     | golden-winged warbler          | <i>Vermivora chrysoptera</i>                | 9             |
| bird     | Arizona Bell's vireo           | <i>Vireo bellii arizonae</i>                | 3             |
| bird     | gray vireo                     | <i>Vireo vicinior</i>                       | 3, 5          |

| Category | Common Name            | Scientific Name                                  | Regions found |
|----------|------------------------|--|---------------|
| bivalve  | elktoe                 | <i>Alasmidonta marginata</i>                     | 8, 9          |
| bivalve  | triangle floater       | <i>Alasmidonta undulata</i>                      | 8             |
| bivalve  | brook floater          | <i>Alasmidonta varicose</i>                      | 8, 9          |
| bivalve  | slippershell           | <i>Alasmidonta viridis</i>                       | 8, 9          |
| bivalve  | threeridge mussel      | <i>Amblema plicata</i>                           | 9             |
| bivalve  | California floater     | <i>Anodonta californiensis</i>                   | 3, 5          |
| bivalve  | Apalachicola floater   | <i>Anodonta heardi</i>                           | 8             |
| bivalve  | flat floater           | <i>Anodonta suborbiculata</i>                    | 9             |
| bivalve  | rayed creekshell       | <i>Anodontoides radiatus</i>                     | 8             |
| bivalve  | Alabama spike          | <i>Elliptio arca</i>                             | 8             |
| bivalve  | delicate spike         | <i>Elliptio arctata</i>                          | 8             |
| bivalve  | elephantear            | <i>Elliptio crassidens</i>                       | 9             |
| bivalve  | Atlantic spike         | <i>Elliptio producta</i>                         | 8             |
| bivalve  | inflated spike         | <i>Elliptio purpurella</i>                       | 8             |
| bivalve  | Roanoke slabshell      | <i>Elliptio roanokensis</i>                      | 8             |
| bivalve  | Texas pigtoe           | <i>Fusconaia askewi</i>                          | 8             |
| bivalve  | ebonyshell             | <i>Fusconaia ebena</i>                           | 9             |
| bivalve  | Wabash pigtoe          | <i>Fusconaia flava</i>                           | 9             |
| bivalve  | longsolid mussel       | <i>Fusconaia subrotunda</i><br><i>subrotunda</i> | 8, 9          |
| bivalve  | western ridged mussel  | <i>Gonidea angulata</i>                          | 6             |
| bivalve  | yellow lampmussel      | <i>Lampsilis cariosa</i>                         | 8             |
| bivalve  | northern brokenray     | <i>Lampsilis reeveiana brittsi</i>               | 9             |
| bivalve  | sandbank pocketbook    | <i>Lampsilis satura</i>                          | 8             |
| bivalve  | Alabama heelsplitter   | <i>Lasmigona alabamensis</i>                     | 8             |
| bivalve  | white heelsplitter     | <i>Lasmigona complanate</i>                      | 9             |
| bivalve  | creek heelsplitter     | <i>Lasmigona compressa</i>                       | 9             |
| bivalve  | flutedshell            | <i>Lasmigona costata</i>                         | 9             |
| bivalve  | Etowah heelsplitter    | <i>Lasmigona etowaensis</i>                      | 8             |
| bivalve  | Tennessee heelsplitter | <i>Lasmigona holstonia</i>                       | 8             |
| bivalve  | green floater          | <i>Lasmigona subviridis</i>                      | 8, 9          |
| bivalve  | Arkansas mudalia       | <i>Leptoxis arkansensis</i>                      | 9             |
| bivalve  | eastern pondmussel     | <i>Ligumia nasuta</i>                            | 9             |
| bivalve  | black sandshell        | <i>Ligumia recta</i>                             | 9             |
| bivalve  | western pearlshell     | <i>Margaritifera falcata</i>                     | 1             |
| bivalve  | southern hickorynut    | <i>Obovaria jacksoniana</i>                      | 8             |
| bivalve  | Alabama hickorynut     | <i>Obovaria unicolor</i>                         | 8             |
| bivalve  | montane peaclam        | <i>Pisidium ultrmontanum</i>                     | 5, 6          |
| bivalve  | Mississippi pigtoe     | <i>Pleurobema beadleianum</i>                    | 8             |
| bivalve  | Ohio pigtoe            | <i>Pleurobema cordatum</i>                       | 8, 9          |
| bivalve  | Tennessee clubshell    | <i>Pleurobema oviforme</i>                       | 8             |
| bivalve  | pink pigtoe            | <i>Pleurobema pyramidatum</i>                    | 8             |
| bivalve  | Louisiana pigtoe       | <i>Pleurobema riddellii</i>                      | 8             |
| bivalve  | pyramid pigtoe         | <i>Pleurobema rubrum</i>                         | 8             |
| bivalve  | round pigtoe           | <i>Pleurobema sintoxia</i>                       | 9             |



| Category   | Common Name                     | Scientific Name                     | Regions found |
|------------|---------------------------------|-------------------------------------|---------------|
| bivalve    | Tennessee pigtoe                | <i>Pleuroonia barnesiana</i>        | 8             |
| bivalve    | Texas heelsplitter              | <i>Potamilus amphichaenus</i>       | 8             |
| bivalve    | Ouachita kidneyshell            | <i>Ptychobranchnus occidentalis</i> | 9             |
| bivalve    | salamander mussel               | <i>Simpsonaias ambigua</i>          | 8, 9          |
| bivalve    | Alabama creekmussel             | <i>Strophitus connasaugaensis</i>   | 8             |
| bivalve    | southern creekmussel            | <i>Strophitus subvexus</i>          | 8             |
| bivalve    | southern purple lilliput        | <i>Toxolasma corvunculus</i>        | 8             |
| bivalve    | purple lilliput                 | <i>Toxolasma lividum</i>            | 8, 9          |
| bivalve    | savannah lilliput               | <i>Toxolasma pullus</i>             | 8             |
| bivalve    | ellipse                         | <i>Venustaconcha ellipsiformis</i>  | 9             |
| bivalve    | Ouachita creekshell             | <i>Villosa arkansasensis</i>        | 8             |
| bivalve    | rainbow                         | <i>Villosa iris</i>                 | 9             |
| bivalve    | little spectaclecase            | <i>Villosa lienosa</i>              | 9             |
| bivalve    | Alabama rainbow                 | <i>Villosa nebulosa</i>             | 8             |
| bivalve    | Coosa creekshell                | <i>Villosa umbrans</i>              | 8             |
| bivalve    | Carolina creekshell             | <i>Villosa vaughaniana</i>          | 8             |
| crustacean | Hubricht's long-tailed amphipod | <i>Allocrangonyx hubrichti</i>      | 9             |
| crustacean | short-tail bactroid             | <i>Bactrurus brachycaudus</i>       | 9             |
| crustacean | Kaibab fairy shrimp             | <i>Branchinecta kaibabensis</i>     | 3             |
| crustacean | a cave obligate isopod          | <i>Caecidotea bicrenata whitei</i>  | 9             |
| crustacean | cannulate cave isopod           | <i>Caecidotea cannula</i>           | 9             |
| crustacean | an isopod                       | <i>Caecidotea dimorpha</i>          | 9             |
| crustacean | Holsinger's Cave isopod         | <i>Caecidotea holsingeri</i>        | 9             |
| crustacean | incurved cave isopod            | <i>Caecidotea incurva</i>           | 8             |
| crustacean | a cave obligate isopod          | <i>Caecidotea simonini</i>          | 9             |
| crustacean | a cave isopod                   | <i>Caecidotea sinuncus</i>          | 9             |
| crustacean | a cave isopod                   | <i>Caecidotea stygia</i>            | 9             |
| crustacean | big south fork crayfish         | <i>Cambarus bouchardi</i>           | 8             |
| crustacean | Boston Mountains crayfish       | <i>Cambarus causeyi</i>             | 8             |
| crustacean | chauga crayfish                 | <i>Cambarus chaugaensis</i>         | 8             |
| crustacean | mountain crayfish               | <i>Cambarus conasaugaensis</i>      | 8             |
| crustacean | Conasaugu blue burrower         | <i>Cambarus cymatilis</i>           | 8             |
| crustacean | Elk River crayfish              | <i>Cambarus elkensis</i>            | 9             |
| crustacean | Chickamauga crayfish            | <i>Cambarus extraneus</i>           | 8             |
| crustacean | Little Tennessee River crayfish | <i>Cambarus georgiae</i>            | 8             |
| crustacean | Greenbrier Cave crayfish        | <i>Cambarus nerterius</i>           | 9             |
| crustacean | Hiwassee headwaters crayfish    | <i>Cambarus parrishi</i>            | 8             |
| crustacean | Greenbrier River crayfish       | <i>Cambarus smilax</i>              | 9             |
| crustacean | beautiful crayfish              | <i>Cambarus speciosus</i>           | 8             |
| crustacean | Guyandotte River crayfish       | <i>Cambarus veteranus</i>           | 8             |
| crustacean | northern cavefish copepod       | <i>Cauloxenus stygius</i>           | 9             |
| crustacean | Anomalous Spring amphipod       | <i>Crangonyx anomalus</i>           | 9             |
| crustacean | Barr's Cave amphipod            | <i>Crangonyx barri</i>              | 9             |
| crustacean | amphipod                        | <i>Crangonyx castellanum</i>        | 8             |
| crustacean | Florida Cave amphipod           | <i>Crangonyx grandimanus</i>        | 8             |

| Category   | Common Name                         | Scientific Name                      | Regions found |
|------------|-------------------------------------|--------------------------------------|---------------|
| crustacean | Hobb's Cave amphipod                | Crangonyx hobbsi                     | 8             |
| crustacean | Indiana Cave amphipod               | Crangonyx indianensis                | 9             |
| crustacean | Packard Cave amphipod               | Crangonyx packardi                   | 9             |
| crustacean | a cave obligate copepod             | Diacyclops jeanneli jeanneli         | 9             |
| crustacean | Piedmont Prairie burrowing crayfish | Distocambarus crockeri               | 8             |
| crustacean | Newberry burrowing crayfish         | Distocambarus youngineri             | 8             |
| crustacean | speckled burrowing crayfish         | Fallicambarus danielae               | 8             |
| crustacean | Camp Shelby burrowing crayfish      | Fallicambarus gordonii               | 8             |
| crustacean | sabine burrowing crayfish           | Fallicambarus wallsi                 | 8             |
| crustacean | Mena crayfish                       | Faxonius menae                       | 8             |
| crustacean | Bousfield's amphipod                | Gammarus bousfieldi                  | 9             |
| crustacean | an isopod                           | Lirceus bicuspidatus                 | 8             |
| crustacean | Donnaldson's Cave copepod           | Megacyclops donnaldsoni              | 9             |
| crustacean | isopod                              | Miktoniscus racovitzi                | 8             |
| crustacean | coldwater crayfish                  | Orconectes eupunctus                 | 9             |
| crustacean | Indiana crayfish                    | Orconectes indianensis               | 9             |
| crustacean | ghost crayfish                      | Orconectes inermis inermis           | 9             |
| crustacean | Kentucky crayfish                   | Orconectes kentuckiensis             | 9             |
| crustacean | Meek's crayfish                     | Orconectes meeki                     | 9             |
| crustacean | Appalachian cave crayfish           | Orconectes packardi                  | 8             |
| crustacean | Big Creek crayfish                  | Orconectes peruncus                  | 9             |
| crustacean | Bigclaw crayfish                    | Orconectes placidus                  | 9             |
| crustacean | St. Francis River crayfish          | Orconectes quadruncus                | 9             |
| crustacean | Kiamichi crayfish                   | Orconectes saxatilis                 | 8             |
| crustacean | Sinkhole crayfish                   | Orconectes theaphionensis            | 9             |
| crustacean | William's crayfish                  | Orconectes williamsi                 | 8, 9          |
| crustacean | Silver Glen Springs crayfish        | Procambarus attiguus                 | 8             |
| crustacean | Jackson Prairie crayfish            | Procambarus barbiger                 | 8             |
| crustacean | Bigcheek Cave crayfish              | Procambarus delicatus                | 8             |
| crustacean | spinytail crayfish                  | Procambarus fitzpatricki             | 8             |
| crustacean | Big Blue Spring crayfish            | Procambarus horsti                   | 8             |
| crustacean | Woodville Karst cave crayfish       | Procambarus orcinus                  | 8             |
| crustacean | Irons Fork burrowing crayfish       | Procambarus reimeri                  | 8             |
| crustacean | Jeannel's Cave ostracod             | Pseudocandona jeanneli               | 9             |
| crustacean | a cave springtail                   | Pygmarrhopalites sacer               | 8             |
| crustacean | swimming Florida cave isopod        | Remasellus parvus                    | 8             |
| crustacean | Indiana groundwater copepod         | Rheocyclops indiana                  | 9             |
| crustacean | Dumont's fairy shrimp               | <i>Streptocephalus henridumontis</i> | 3             |
| crustacean | James Cave amphipod                 | Stygobromus abditus                  | 8             |
| crustacean | Carolina seep scud                  | Stygobromus carolinensis             | 8             |
| crustacean | Culver's Cave amphipod              | Stygobromus culveri                  | 9             |
| crustacean | Greenbrier Cave amphipod            | Stygobromus emarginatus              | 8, 9          |
| crustacean | Franz's Cave amphipod               | Stygobromus franzi                   | 9             |
| crustacean | Shenandoah Valley cave amphipod     | Stygobromus gracilipes               | 8             |

| Category   | Common Name                    | Scientific Name                               | Regions found |
|------------|--------------------------------|---|---------------|
| crustacean | Alleghany County cave amphipod | <i>Stygobromus hoffmani</i>                   | 8             |
| crustacean | Bath County cave amphipod      | <i>Stygobromus mundus</i>                     | 8             |
| crustacean | Pocahontas Cave amphipod       | <i>Stygobromus nanus</i>                      | 9             |
| crustacean | Minute Cave amphipod           | <i>Stygobromus parvus</i>                     | 9             |
| crustacean | Least Cave stygobromid         | <i>Stygobromus pollostus</i>                  | 8             |
| crustacean | spiny cave stygobromid         | <i>Stygobromus spinatus</i>                   | 8             |
| crustacean | subtle stygobromid             | <i>Stygobromus subtilis</i>                   | 9             |
| fish       | lake sturgeon                  | <i>Acipenser fulvescens</i>                   | 8, 9          |
| fish       | Alabama shad                   | <i>Alosa alabamae</i>                         | 8             |
| fish       | northern cavefish              | <i>Amblyopsis spelaea</i>                     | 9             |
| fish       | western sand darter            | <i>Ammocrypta clara</i>                       | 8, 9          |
| fish       | American eel                   | <i>Anguilla rostrata</i>                      | 9             |
| fish       | Mexican stoneroller            | <i>Campostoma ornatum</i>                     | 3             |
| fish       | highfin carpsucker             | <i>Carpoides velifer</i>                      | 9             |
| fish       | desert sucker                  | <i>Catostomus clarkii</i>                     | 3             |
| fish       | bluehead sucker                | <i>Catostomus discobolus</i>                  | 2             |
| fish       | Sonora sucker                  | <i>Catostomus insignis</i>                    | 3             |
| fish       | flannelmouth sucker            | <i>Catostomus latipinnis</i>                  | 2             |
| fish       | Modoc sucker                   | <i>Catostomus microps</i>                     | 6             |
| fish       | Goose Lake sucker              | <i>Catostomus occidentalis lacusanserinus</i> | 5, 6          |
| fish       | mountain sucker                | <i>Catostomus platyrhynchus</i>               | 2             |
| fish       | Rio Grande sucker              | <i>Catostomus plebeius</i>                    | 3             |
| fish       | Little Colorado sucker         | <i>Catostomus sp.3</i>                        | 3             |
| fish       | northern redbelly dace         | <i>Chrosomus eos</i>                          | 2             |
| fish       | southern redbelly dace         | <i>Chrosomus erythrogaster</i>                | 2             |
| fish       | finescale dace                 | <i>Chrosomus neogaeus</i>                     | 2             |
| fish       | redside dace                   | <i>Clinostomus elongatus</i>                  | 9             |
| fish       | Nipigon cisco                  | <i>Coregonus nipigon</i>                      | 9             |
| fish       | shortjaw cisco                 | <i>Coregonus zenithicus</i>                   | 9             |
| fish       | Wood River sculpin             | <i>Cottus leiopomus</i>                       | 4             |
| fish       | marginated sculpin             | <i>Cottus marginatus</i>                      | 6             |
| fish       | pit sculpin                    | <i>Cottus pitensis</i>                        | 6             |
| fish       | lake chub                      | <i>Couesius plumbeus</i>                      | 2, 6          |
| fish       | crystal darter                 | <i>Crystallaria asprella</i>                  | 8, 9          |
| fish       | bluestripe shiner              | <i>Cyprinella callitaenia</i>                 | 8             |
| fish       | Miller Lake lamprey            | <i>Entosphenus minimus</i>                    | 6             |
| fish       | Klamath River lamprey          | <i>Entosphenus similis</i>                    | 5             |
| fish       | Pacific lamprey                | <i>Entosphenus tridentatus</i>                | 6             |
| fish       | Goose Lake lamprey             | <i>Entosphenus tridentatus ssp.</i>           | 5             |
| fish       | blotched chub                  | <i>Erimystax insignis</i>                     | 8             |
| fish       | lake chubsucker                | <i>Erimyzon sucetta</i>                       | 9             |
| fish       | sharphead darter               | <i>Etheostoma acuticeps</i>                   | 8             |
| fish       | warrior darter                 | <i>Etheostoma bellator</i>                    | 8             |
| fish       | holiday darter                 | <i>Etheostoma brevirostrum</i>                | 8             |

| Category | Common Name               | Scientific Name                     | Regions found |
|----------|---------------------------|-------------------------------------|---------------|
| fish     | ashy darter               | <i>Etheostoma cinereum</i>          | 8             |
| fish     | coldwater darter          | <i>Etheostoma ditrema</i>           | 8             |
| fish     | Tuskaloosa darter         | <i>Etheostoma douglasi</i>          | 8             |
| fish     | Arkansas saddled darter   | <i>Etheostoma euzonum euzonum</i>   | 9             |
| fish     | greenthroat darter        | <i>Etheostoma lepidum</i>           | 3             |
| fish     | harlequin darter          | <i>Etheostoma histrio</i>           | 9             |
| fish     | spotted darter            | <i>Etheostoma maculatum</i>         | 8, 9          |
| fish     | least darter              | <i>Etheostoma microperca</i>        | 9             |
| fish     | candy darter              | <i>Etheostoma osburni</i>           | 9             |
| fish     | paleback darter           | <i>Etheostoma pallidorsum</i>       | 8             |
| fish     | yazoo darter              | <i>Etheostoma raneyi</i>            | 8             |
| fish     | arrow darter              | <i>Etheostoma sagitta sagitta</i>   | 8             |
| fish     | Tippecanoe darter         | <i>Etheostoma tippecanoe</i>        | 8             |
| fish     | wounded darter            | <i>Etheostoma vulneratum</i>        | 8             |
| fish     | tonguetied minnow         | <i>Exoglossum laurae</i>            | 9             |
| fish     | plains topminnow          | <i>Fundulus sciadicus</i>           | 2             |
| fish     | Lahontan Lake tui chu     | <i>Gila bicolor pectinifer</i>      | 5             |
| fish     | Goose Lake tui chub       | <i>Gila bicolor thallassina</i>     | 5             |
| fish     | headwater chub            | <i>Gila nigra</i>                   | 3             |
| fish     | arroyo chub               | <i>Gila orcutti</i>                 | 5             |
| fish     | Rio Grande chub           | <i>Gila pandora</i>                 | 3             |
| fish     | roundtail chub            | <i>Gila robusta</i>                 | 2, 3          |
| fish     | western silvery minnow    | <i>Hybognathus argyritis</i>        | 9             |
| fish     | plains minnow             | <i>Hybognathus placitus</i>         | 2             |
| fish     | lined chub                | <i>Hybopsis lineapunctata</i>       | 8             |
| fish     | headwater catfish         | <i>Ictalurus lupus</i>              | 3             |
| fish     | Ohio lamprey              | <i>Ichthyomyzon bdellium</i>        | 9             |
| fish     | northern brook lamprey    | <i>Ichthyomyzon fossor</i>          | 8, 9          |
| fish     | mountain brook lamprey    | <i>Ichthyomyzon greeleyi</i>        | 8, 9          |
| fish     | Kern brook lamprey        | <i>Lampetra hubbsi</i>              | 5             |
| fish     | western brook lamprey     | <i>Lampetra richardsoni</i>         | 5             |
| fish     | pacific lamprey           | <i>Lampetra tridentata</i>          | 1             |
| fish     | Goose Lake lamprey        | <i>Lampetra tridentata ssp.</i>     | 5             |
| fish     | Clear Lake hitch          | <i>Lavinia exilicauda chi</i>       | 5             |
| fish     | pit roach                 | <i>Lavinia symmetricus mitrulus</i> | 6             |
| fish     | southern leatherside chub | <i>Lepidomeda aliciae</i>           | 4             |
| fish     | northern leatherside chub | <i>Lepidomeda copei</i>             | 4             |
| fish     | longear sunfish           | <i>Lepomis megalotis</i>            | 9             |
| fish     | redspotted sunfish        | <i>Lepomis miniatus</i>             | 9             |
| fish     | bantam sunfish            | <i>Lepomis symmetricus</i>          | 9             |
| fish     | burbot                    | <i>Lota lota</i>                    | 1, 9          |
| fish     | Ouachita shiner           | <i>Lythurus snelsoni</i>            | 8             |
| fish     | sturgeon chub             | <i>Macrhybopsis gelida</i>          | 2             |
| fish     | pearl dace                | <i>Margariscus margarita</i>        | 9             |

| Category | Common Name                     | Scientific Name                              | Regions found |
|----------|---------------------------------|--|---------------|
| fish     | northern pearl dace             | <i>Margariscus nachtriebi</i>                | 2             |
| fish     | redeye bass                     | <i>Micropterus coosae</i>                    | 8             |
| fish     | Suwannee bass                   | <i>Micropterus notius</i>                    | 8             |
| fish     | robust redhorse                 | <i>Moxostoma robustum</i>                    | 8             |
| fish     | Apalachicola redhorse           | <i>Moxostoma</i> sp. 1                       | 8             |
| fish     | greater redhorse                | <i>Moxostoma valenciennesi</i>               |               |
| fish     | hardhead                        | <i>Mylopharodon conocephalus</i>             | 5             |
| fish     | hornyhead chub                  | <i>Nocomis biguttatus</i>                    | 2             |
| fish     | pugnose shiner                  | <i>Notropis anagenus</i>                     | 9             |
| fish     | popeye shiner                   | <i>Notropis ariommus</i>                     | 8             |
| fish     | bridle shiner                   | <i>Notropis bifrenatus</i>                   | 8             |
| fish     | ironcolor shiner                | <i>Notropis chalybaeus</i>                   | 8             |
| fish     | bigmouth shiner                 | <i>Notropis dorsalis</i>                     | 9             |
| fish     | Blacknose Shiner                | <i>Notropis heterolepis</i>                  | 9             |
| fish     | Kiamichi shiner                 | <i>Notropis ortenburgeri</i>                 | 8             |
| fish     | Ozark shiner                    | <i>Notropis ozarcanus</i>                    | 8, 9          |
| fish     | peppered shiner                 | <i>Notropis perpallidus</i>                  | 8             |
| fish     | Sabine shiner                   | <i>Notropis sabinae</i>                      | 9             |
| fish     | New River Shiner                | <i>Notropis scabriceps</i>                   | 9             |
| fish     | roughhead shiner                | <i>Notropis semperasper</i>                  | 8             |
| fish     | rocky shiner                    | <i>Notropis suttkusi</i>                     | 8             |
| fish     | skygazer shiner                 | <i>Notropis uranoscopus</i>                  | 8             |
| fish     | mountain madtom                 | <i>Noturus eleutherus</i>                    | 9             |
| fish     | orange-fin madtom               | <i>Noturus gilberti</i>                      | 8             |
| fish     | piebald madtom                  | <i>Noturus gladiator</i>                     | 8             |
| fish     | Ouachita madtom                 | <i>Noturus lachneri</i>                      | 8             |
| fish     | frecklebelly madtom             | <i>Noturus munitus</i>                       | 8             |
| fish     | northern madtom                 | <i>Noturus stigmosus</i>                     | 8, 9          |
| fish     | caddo madtom                    | <i>Noturus taylori</i>                       | 8             |
| fish     | Olympic mudminnow               | <i>Novumbra hubbsi</i>                       | 6             |
| fish     | coastal run cutthroat trout     | <i>Oncorhynchus clarkii</i>                  | 5             |
| fish     | Yellowstone cutthroat           | <i>Oncorhynchus clarkii bouveri</i>          | 2, 4          |
| fish     | coastal cutthroat trout         | <i>Oncorhynchus clarkia clarkia</i>          | 6             |
| fish     | westslope cutthroat             | <i>Oncorhynchus clarki lewisi</i>            | 1, 4, 6       |
| fish     | Colorado River cutthroat        | <i>Oncorhynchus clarki pleuriticus</i>       | 2, 4          |
| fish     | Bonneville cutthroat trout      | <i>Oncorhynchus clarki Utah</i>              | 4             |
| fish     | Rio Grande cutthroat            | <i>Oncorhynchus clarkii virginalis</i>       | 3             |
| fish     | chum salmon – Pacific coast ESU | <i>Oncorhynchus keta</i>                     | 6             |
| fish     | steelhead, Oregon Coast DPS     | <i>Oncorhynchus mykiss</i>                   | 6             |
| fish     | California golden trout         | <i>Oncorhynchus mykiss aquabonita</i>        | 5             |
| fish     | Eagle Lake rainbow trout        | <i>Oncorhynchus mykiss aquilarum (pop 5)</i> | 5             |

| Category | Common Name  | Scientific Name                       | Regions found |
|----------|--|---------------------------------------|---------------|
| fish     | interior redband trout / Inland Columbia Basin redband trout | <i>Oncorhynchus mykiss gairdneri</i>  | 1, 6          |
| fish     | Kern River rainbow trout                                     | <i>Oncorhynchus mykiss gilberti</i>   | 5             |
| fish     | Steelhead – Klamath Mountains Province DPS                   | <i>Oncorhynchus mykiss irideus</i>    | 5, 6          |
| fish     | Oregon Great Basin redband trout                             | <i>Oncorhynchus mykiss newberri</i>   | 6             |
| fish     | Warner Valley redband trout                                  | <i>Oncorhynchus mykiss pop 4</i>      | 5             |
| fish     | Goose Lake redband trout                                     | <i>Oncorhynchus mykiss pop 6</i>      | 5             |
| fish     | McCloud River redband trout                                  | <i>Oncorhynchus mykiss pop 7</i>      | 5             |
| fish     | chinook salmon, Upper Klamath-Trinity ESU                    | <i>Oncorhynchus tshawytscha</i>       | 5             |
| fish     | SONCC chinook salmon   | <i>Oncorhynchus tshawytscha</i> ssp.  | 5, 6          |
| fish     | Oregon chub  | <i>Oregonichthys crameri</i>          | 6             |
| fish     | Umpqua chub  | <i>Oregonichthys kalawatseti</i>      | 6             |
| fish     | cheat minnow   | <i>Pararhinichthys bowersi</i>        | 9             |
| fish     | Ouachita darter  | <i>Percina brucethompsoni</i>         | 8             |
| fish     | blotchside darter  | <i>Percina burtoni</i>                | 8             |
| fish     | Channel Darter   | <i>Percina copelandi</i>              | 9             |
| fish     | Bluestripe Darter  | <i>Percina cymatotaenia</i>           | 9             |
| fish     | Appalachia Darter  | <i>Percina gymnocephala</i>           | 9             |
| fish     | bridled darter   | <i>Percina kusha</i>                  | 8             |
| fish     | longhead darter  | <i>Percina macrocephala</i>           | 8             |
| fish     | longnose darter  | <i>Percina nasuta</i>                 | 8, 9          |
| fish     | bankhead darter  | <i>Percina sipsi</i>                  | 8             |
| fish     | olive darter   | <i>Percina squamata</i>               | 8             |
| fish     | stargazing darter  | <i>Percina uranidea</i>               | 8, 9          |
| fish     | sickle darter  | <i>Percina williamsi</i>              | 8             |
| fish     | Kanawha minnow   | <i>Phenacobius teretulus</i>          | 8, 9          |
| fish     | northern redbelly dace                                       | <i>Phoxinus eos</i>                   | 1             |
| fish     | Eastern Slim Minnow  | <i>Pimephales tenellus parviceps</i>  | 9             |
| fish     | flathead chub  | <i>Platygobio gracilis</i>            | 2             |
| fish     | pygmy whitefish  | <i>Prosopium coulterii</i>            | 6             |
| fish     | Big Lost River whitefish                                     | <i>Prosopium williamsoni</i>          | 4             |
| fish     | bluenose shiner  | <i>Pteronotropis welaka</i>           | 8             |
| fish     | Santa Ana speckled dace                                      | <i>Rhinichthys osculus ssp 8</i>      | 5             |
| fish     | Umatilla dace  | <i>Rhinichthys umatilla</i>           | 6             |
| fish     | Oregon Lakes tui chub  | <i>Siphaletes bicolor oregonensis</i> | 6             |
| fish     | Goose Lake tui chub  | <i>Siphaletes bicolor thalassina</i>  | 6             |
| fish     | arctic grayling  | <i>Thymallus arcticus montanus</i>    | 1             |
| fish     | southern cavefish  | <i>Typhlichthys subterraneus</i>      | 8, 9          |
| flatworm | a planarian  | <i>Geocentrophora cavernicola</i>     | 8             |
| flatworm | a cave obligate planarian                                    | <i>Phagocata angusta</i>              | 9             |
| flatworm | Culver's planarian   | <i>Sphalloplana culveri</i>           | 9             |

| Category  | Common Name                    | Scientific Name                         | Regions found |
|-----------|--------------------------------|---|---------------|
| flatworm  | a cave obligate planarian      | <i>Sphalloplana hubricgti</i>           | 9             |
| flatworm  | Weingartner's cave flatworm    | <i>Spalloplana weingartneri</i>         | 9             |
| gastropod | Rocky Mountain capshell        | <i>Acroloxus coloradensis</i>           | 2             |
| gastropod | Pine Mountain tigersnail       | <i>Anguispira rugoderma</i>             | 8             |
| gastropod | dense hydrobe                  | <i>Aphaostracon pycnus</i>              | 8             |
| gastropod | Silver Creek woodlandsnail     | <i>Asmunella binneyi</i>                | 3             |
| gastropod | no common name                 | <i>Asmunella cockerelli argenticola</i> | 3             |
| gastropod | Black Range woodlandsnail      | <i>Asmunella cockerelli cockerelli</i>  | 3             |
| gastropod | no common name                 | <i>Asmunella cockerelli perobtusa</i>   | 3             |
| gastropod | Whitewater Creek woodlandsnail | <i>Asmunella danielsi</i>               | 3             |
| gastropod | Iron Creek woodlandsnail       | <i>Asmunella mendax</i>                 | 3             |
| gastropod | Capitan woodlandsnail          | <i>Asmunella pseudodonta</i>            | 3             |
| gastropod | no common name                 | <i>Asmunella tetrodon animorum</i>      | 3             |
| gastropod | no common name                 | <i>Asmunella tetrodon inermis</i>       | 3             |
| gastropod | no common name                 | <i>Asmunella tetrodon mutator</i>       | 3             |
| gastropod | Dry Creek woodlandsnail        | <i>Asmunella tetrodon tetrodon</i>      | 3             |
| gastropod | Cascades axetail slug          | <i>Carinacauda stormi</i>               | 6             |
| gastropod | Pleistocene catinella          | <i>Catinella exile</i>                  | 9             |
| gastropod | Harney Basin duskytail         | <i>Colligyrus depressus</i>             | 6             |
| gastropod | Rocky Mountain duskysnail      | <i>Colligyrus greggi</i>                | 6             |
| gastropod | Puget Oregonian                | <i>Cryptomastix devia</i>               | 6             |
| gastropod | Columbia Gorge Oregonian       | <i>Cryptomastix hendersoni</i>          | 6             |
| gastropod | poplar Oregonian               | <i>Cryptomastix populi</i>              | 6             |
| gastropod | knotty elimia                  | <i>Elimia christyi</i>                  | 8             |
| gastropod | carinate pillsnail             | <i>Euchemotrema hubrichti</i>           | 9             |
| gastropod | a terrestrial snail            | <i>Euconulus alderi</i>                 | 9             |
| gastropod | shortface lanx                 | <i>Fisherola nuttalli</i>               | 6             |
| gastropod | Alexander siltsnail            | <i>Floridobia alexander</i>             | 8             |
| gastropod | flatwood siltsnail             | <i>Floridobia leptospira</i>            | 8             |
| gastropod | Columbia pebblesnail           | <i>Fluminicola fuscus</i>               | 6             |
| gastropod | Modoc pebblesnail              | <i>Fluminicola modoci</i>               | 6             |
| gastropod | nugget pebblesnail             | <i>Fluminicola seminalis</i>            | 5             |
| gastropod | turban pebblesnail             | <i>Fluminicola turbiniformis</i>        | 6             |
| gastropod | Olympia pebblesnail            | <i>Fluminicola virens</i>               | 6             |
| gastropod | organ cavesnail                | <i>Fontigens tartarea</i>               | 8, 9          |
| gastropod | Archer's toothed landsnail     | <i>Fumonelix archeri</i>                | 8             |
| gastropod | clifty covert                  | <i>Fumonelix wetherbyi</i>              | 8             |
| gastropod | Rio Grande snaggletooth        | <i>Gastrocopta riograndensis</i>        | 3             |
| gastropod | Ruidoso snaggletooth           | <i>Gastrocopta ruidosensis</i>          | 3             |
| gastropod | Appalachia bellytooth          | <i>Gastrodonta fonticula</i>            | 8             |
| gastropod | thin glyph                     | <i>Glyphyalinia cryptomphala</i>        | 9             |
| gastropod | blue-gray glyph                | <i>Glyphyalinia ocoae</i>               | 8             |

| Category  | Common Name                   | Scientific Name                          | Regions found |
|-----------|-------------------------------|--|---------------|
| gastropod | Maryland glyph                | <i>Glyphyalinia raderi</i>               | 8             |
| gastropod | shaggy coil                   | <i>Helicodiscus diadema</i>              | 8             |
| gastropod | salmon coil                   | <i>Helicodiscus salmonaceus</i>          | 6             |
| gastropod | talus coil                    | <i>Helicodiscus triodus</i>              | 8             |
| gastropod | Great basin ramshorn          | <i>Helisoma newberryi</i>                | 5, 6          |
| gastropod | Oregon shoulderband           | <i>Helminthoglypta hertleini</i>         | 6             |
| gastropod | keeled jumping-slug           | <i>Hemphillia burrington</i>             | 6             |
| gastropod | Malone jumping-slug           | <i>Hemphillia malonei</i>                | 6             |
| gastropod | vagabond holospira            | <i>Holospira montivaga</i>               | 3             |
| gastropod | northern threeband            | <i>Humboldtiana ultima</i>               | 3             |
| gastropod | Magazine Mountain shagreen    | <i>Inflectarius magazinensis</i>         | 8             |
| gastropod | velvet covert                 | <i>Inflectarius subpalliatu</i>          | 8             |
| gastropod | spiny river snail             | <i>Io fluviialis</i>                     | 8             |
| gastropod | topaz juga                    | <i>Juga acutifilosa</i>                  | 5, 6          |
| gastropod | chace juga                    | <i>Juga chacei</i>                       | 5             |
| gastropod | black juga                    | <i>Juga nigrina</i>                      | 5             |
| gastropod | scalloped juga                | <i>Juga occata</i>                       | 5             |
| gastropod | highcap lanx                  | <i>Lanx alta</i>                         | 6             |
| gastropod | kneecap lanx                  | <i>Lanx patelloides</i>                  | 5             |
| gastropod | smooth rocksnail              | <i>Leptoxis virgata</i>                  | 8             |
| gastropod | Newcomb's littorine snail     | <i>Littorina subrotundata</i>            | 6             |
| gastropod | magnum mantleslug             | <i>Magnipelta mycophaga</i>              | 6             |
| gastropod | Umatilla megomphix            | <i>Megomphix lutarius</i>                | 6             |
| gastropod | wrinkled button               | <i>Mesomphix rugeli</i>                  | 8             |
| gastropod | green sideband                | <i>Monadenia fidelis flava</i>           | 6             |
| gastropod | Dalles sideband               | <i>Monadenia fidelis minor</i>           | 6             |
| gastropod | Shasta sideband snail         | <i>Monadenia troglodytes troglodytes</i> | 5             |
| gastropod | Wintu sideband snail          | <i>Monadenia troglodytes wintu</i>       | 5             |
| gastropod | bearded mountainsnail         | <i>Oreohelix barbata</i>                 | 3             |
| gastropod | Pinaleno mountainsnail        | <i>Oreohelix grahamensis</i>             | 3             |
| gastropod | Grand Coulee mountainshell    | <i>Oreohelix junii</i>                   | 6             |
| gastropod | no common name                | <i>Oreohelix metcalfei acutidiscus</i>   | 3             |
| gastropod | no common name                | <i>Oreohelix metcalfei concentrica</i>   | 3             |
| gastropod | no common name                | <i>Oreohelix metcalfei metcalfei</i>     | 3             |
| gastropod | no common name                | <i>Oreohelix metcalfei radiata</i>       | 3             |
| gastropod | no common name                | <i>Oreohelix nogalensis</i>              | 3             |
| gastropod | Mineral Creek mountainsnail   | <i>Oreohelix pilsbryi</i>                | 3             |
| gastropod | pygmy mountainsnail           | <i>Oreohelix pygmaea</i>                 | 2             |
| gastropod | Cooper's Rocky Mountain snail | <i>Oreohelix strigosa cooperi</i>        | 2             |
| gastropod | blue mountainshell            | <i>Oreohelix strigosa delicata</i>       | 6             |
| gastropod | Morgan Creek mountainsnail    | <i>Oreohelix swopei</i>                  | 3             |
| gastropod | Dalles mountainshell          | <i>Oreohelix variabilis</i>              | 6             |



| Category  | Common Name                           | Scientific Name                                     | Regions found |
|-----------|---------------------------------------|---|---------------|
| gastropod | brown supercoil                       | <i>Paravitrea septadens</i>                         | 8             |
| gastropod | smooth bladetooth                     | <i>Patera laevior</i>                               | 9             |
| gastropod | shortspire hornsnail                  | <i>Pleurocera curta</i>                             | 8             |
| gastropod | upland hornsnail                      | <i>Pleurocera showalteri</i>                        | 8             |
| gastropod | humped coin                           | <i>Polygyrella polygyrella</i>                      | 6             |
| gastropod | robust walker                         | <i>Pomatiopsis binneyi</i>                          | 6             |
| gastropod | Pacific walker                        | <i>Pomatiopsis californica</i>                      | 6             |
| gastropod | Crater Lake tightcoil                 | <i>Pristiloma crateris</i>                          | 6             |
| gastropod | thinlip tightcoil                     | <i>Pristiloma idahoense</i>                         | 6             |
| gastropod | broadwhorl tighcoil                   | <i>Pristiloma johnsoni</i>                          | 6             |
| gastropod | crowned tightcoil                     | <i>Pristiloma pilsbryi</i>                          | 6             |
| gastropod | shiny tightcoil                       | <i>Pristiloma wascoense</i>                         | 6             |
| gastropod | pristine springsnail                  | <i>Pristinicola hemphilli</i>                       | 5, 6          |
| gastropod | blue-gray tail-dropper                | <i>Prophysaon coeruleum</i>                         | 6             |
| gastropod | Archimedes springsnail                | <i>Pyrgulopsis archimedis</i>                       | 6             |
| gastropod | Gila springsnail                      | <i>Pyrgulopsis gilae</i>                            | 3             |
| gastropod | Verde Rim springsnail                 | <i>Pyrgulopsis glandulosa</i>                       | 3             |
| gastropod | Willow Creek pyrg                     | <i>Pyrgulopsis lasseni</i>                          | 5             |
| gastropod | page springsnail                      | <i>Pyrgulopsis morrisoni</i>                        | 3             |
| gastropod | Jackson Lake springsnail              | <i>Pyrgulopsis robusta</i>                          | 6             |
| gastropod | fossil springsnail                    | <i>Pyrgulopsis simplex</i>                          | 3             |
| gastropod | brown springsnail                     | <i>Pyrgulopsis sola</i>                             | 3             |
| gastropod | New Mexico springsnail                | <i>Pyrgulopsis thermalis</i>                        | 3             |
| gastropod | Huachuca springsnail                  | <i>Pyrgulopsis thompsoni</i>                        | 3             |
| gastropod | fir pinwheel                          | <i>Radiodiscus abietum</i>                          | 6             |
| gastropod | domed ancylid                         | <i>Rhodacme elatior</i>                             | 8             |
| gastropod | Warner Spring shoulderband snail      | <i>Rothelix warnerfontis</i>                        | 5             |
| gastropod | Clark Peak talussnail                 | <i>Sonorella christenseni</i>                       | 3             |
| gastropod | Pinaleno talussnail                   | <i>Sonorella grahamensis</i>                        | 3             |
| gastropod | New Mexico talussnail                 | <i>Sonorella hachitana</i><br><i>peloncillensis</i> | 3             |
| gastropod | mimic talussnail                      | <i>Sonorella imitator</i>                           | 3             |
| gastropod | wet canyon talussnail                 | <i>Sonorella macrophallus</i>                       | 3             |
| gastropod | Sonoran talussnail                    | <i>Sonorella magdalenensis</i>                      | 3             |
| gastropod | highland slitmouth                    | <i>Stenotrema pilsbryi</i>                          | 8             |
| gastropod | Pilsbry's narrow-apertured land snail | <i>Stenotrema pilsbryi</i>                          | 8             |
| gastropod | a freshwater snail                    | <i>Taylorconcha insperata</i>                       | 6             |
| gastropod | Shasta chaparral snail                | <i>Trilobopsis roperi</i>                           | 5             |
| gastropod | Tehama chaparral snail                | <i>Trilobopsis tehamana</i>                         | 5             |
| gastropod | multi-rib valonia                     | <i>Vallonia gracilicosta</i>                        | 9             |
| gastropod | crossed dome                          | <i>Ventridens decussatus</i>                        | 8             |
| gastropod | Pacific vertigo                       | <i>Vertigo andrusiana</i>                           | 6             |
| gastropod | delicate vertigo                      | <i>Vertigo bollesiana</i>                           | 8, 9          |
| gastropod | cupped vertigo snail                  | <i>Vertigo clappi</i>                               | 8             |

| Category  | Common Name                  | Scientific Name                            | Regions found |
|-----------|------------------------------|--|---------------|
| gastropod | Dalles hesperian             | <i>Vespericola depressus</i>               | 6             |
| gastropod | tapered vertigo              | <i>Vertigo elatior</i>                     | 9             |
| gastropod | bluff vertigo                | <i>Vertigo meramecensis</i>                | 9             |
| gastropod | six-whorl vertigo            | <i>Vertigo morsei</i>                      | 9             |
| gastropod | deep-throat vertigo          | <i>Vertigo nylanderi</i>                   | 9             |
| gastropod | mystery vertigo              | <i>Vertigo paradoxa</i>                    | 9             |
| gastropod | big bar hesperian snail      | <i>Vespericola pressleyi</i>               | 5             |
| gastropod | Shasta hesperian snail       | <i>Vespericola shasta</i>                  | 5             |
| gastropod | Siskiyou hesperian           | <i>Vespericola sierranus</i>               | 6             |
| gastropod | lined ramshorn               | <i>Vorticifex effusus diagonalis</i>       | 6             |
| gastropod | Klamath ramshorn             | <i>Vorticifex klamathensis lamathensis</i> | 6             |
| insect    | sunrise skipper              | <i>Adopaeoides prittwitzii</i>             | 3             |
| insect    | zigzag darner                | <i>Aeshna sitchensis</i>                   | 6             |
| insect    | subarctic darner             | <i>Aeshna subarctica</i>                   | 6             |
| insect    | red-tailed leafhopper        | <i>Aflexia rubrabura</i>                   | 9             |
| insect    | artesian agapetus caddisfly  | <i>Agapetus artesus</i>                    | 9             |
| insect    | a caddisfly                  | <i>Agapetus jocassee</i>                   | 8             |
| insect    | netwing midge                | <i>Agathon arizonicus</i>                  | 3             |
| insect    | Huachuca giant skipper       | <i>Agathymus evansi</i>                    | 3             |
| insect    | Bell's roadside-skipper      | <i>Amblyscirtes belli</i>                  | 9             |
| insect    | a mayfly                     | <i>Ameletus brownie</i>                    | 9             |
| insect    | a mayfly                     | <i>Ameletus tetius</i>                     | 9             |
| insect    | comet darner                 | <i>Anax longipes</i>                       | 9             |
| insect    | Michigan bog grasshopper     | <i>Appalachia arcana</i>                   | 9             |
| insect    | Sabino Canyon damselfly      | <i>Argia sabino</i>                        | 3             |
| insect    | Beller's ground beetle       | <i>Agonum belleri</i>                      | 6-            |
| insect    | Smokies snowfly              | <i>Allocapnia fumosa</i>                   | 8             |
| insect    | Scott's apatanian caddisfly  | <i>Allomyia scotti</i>                     | 6             |
| insect    | Black Medusa Cave springtail | <i>Arrhopalites ater</i>                   | 9             |
| insect    | Carolyn's Cave springtail    | <i>Arrhopalites carolynae</i>              | 9             |
| insect    | Lewis' cave springtail       | <i>Arrhopalites lewisi</i>                 | 9             |
| insect    | a cave springtail            | <i>Arrhopalites pavo</i>                   | 9             |
| insect    | arogos skipper               | <i>Atrytone arogos iowa</i>                | 1, 2, 8       |
| insect    | cestus skipper               | <i>Atrytonopsis cestus</i>                 | 3             |
| insect    | dusted skipper               | <i>Atrytonopsis hianna</i>                 | 9             |
| insect    | loammi skipper               | <i>Atrytonopsis loammi</i>                 | 8             |
| insect    | Krekeler's Cave ant beetle   | <i>Batrisodes krekeri</i>                  | 9             |
| insect    | Georgia stone                | <i>Beloneuria georgiana</i>                | 8             |
| insect    | Astarte fritillary           | <i>Boloria astarte</i>                     | 6             |
| insect    | meadow fritillary            | <i>Boloria bellona</i>                     | 6             |
| insect    | White Mountain fritillary    | <i>Boloria chariclea montinus</i>          | 9             |
| insect    | Freija fritillary            | <i>Boloria freija</i>                      | 6             |
| insect    | silver-bordered fritillary   | <i>Boloria selene</i>                      | 6             |
| insect    | Morrisoni bumblebee          | <i>Bombus morrisoni</i>                    | 6             |

| Category | Common Name                         | Scientific Name                            | Regions found |
|----------|-------------------------------------|--|---------------|
| insect   | western bumblebee                   | <i>Bombus occidentalis</i>                 | 2, 5, 6       |
| insect   | Suckley cuckoo bumblebee            | <i>Bombus suckleyi</i>                     | 6             |
| insect   | yellow-banded bumblebee             | <i>Bombus terricola</i>                    | 9             |
| insect   | boreal fan moth                     | <i>Brachionycha borealis</i>               | 9             |
| insect   | Jefferson's short-nosed scorpionfly | <i>Brachypanorpa jeffersoni</i>            | 8             |
| insect   | piglet bug                          | <i>Bruchomorpha dorsata</i>                | 9             |
| insect   | a planthopper                       | <i>Bruchomorpha pallidipes</i>             | 9             |
| insect   | northern metalmark                  | <i>Calephelis borealis</i>                 | 8, 9          |
| insect   | swamp metalmark                     | <i>Calephelis muticum</i>                  | 9             |
| insect   | Barry's hairstreak                  | <i>Callophrys gryneus chalcosiva</i>       | 6             |
| insect   | Rosner's hairstreak                 | <i>Callophrys gryneus rosneri</i>          | 6             |
| insect   | Henry's elfin                       | <i>Callophrys Henrici</i>                  | 9             |
| insect   | frosted elphin                      | <i>Callophrys irus</i>                     | 8, 9          |
| insect   | Johnson's hairstreak                | <i>Callophrys johnsoni</i>                 | 6             |
| insect   | San Gabriel Mountains elfin         | <i>Callophrys mossii hidakupa</i>          | 5             |
| insect   | Arapahoe snowfly                    | <i>Capnia arapahoe</i>                     | 2             |
| insect   | a stonefly                          | <i>Capnia caryi</i>                        | 3             |
| insect   | Gerhard's underwing                 | <i>Catocala herodias gerhardi</i>          | 8             |
| insect   | dejected underwing                  | <i>Catocala dejecta</i>                    | 9             |
| insect   | marbled underwing                   | <i>Catocala marmorata</i>                  | 8             |
| insect   | headwaters chilostigman caddisfly   | <i>Chilostigma itascae</i>                 | 9             |
| insect   | Siskiyou short-horned grasshopper   | <i>Chloealtis aspasma</i>                  | 6             |
| insect   | a leafhopper                        | <i>Chlorotettix distinctus</i>             | 9             |
| insect   | a leafhopper                        | <i>Chlorotettix nudatus</i>                | 9             |
| insect   | Spring Mountain checkerspot         | <i>Chlosyne acastus robusta</i>            | 4             |
| insect   | Appalachian tiger beetle            | <i>Cicindela ancocisconensis</i>           | 9             |
| insect   | Siuslaw sand tiger beetle           | <i>Cicindela hirticollis siuslawensis</i>  | 6             |
| insect   | Northern Barrens tiger beetle       | <i>Cicindela patruela</i>                  | 8, 9          |
| insect   | cow path tiger beetle               | <i>Cicindela purpurea</i>                  | 9             |
| insect   | subarctic bluet                     | <i>Coenagrion interrogatum</i>             | 6             |
| insect   | Sullivan's sulphur                  | <i>Colias christina sullivanii</i>         | 6             |
| insect   | Labrador sulphur                    | <i>Colias nastes</i>                       | 6             |
| insect   | intermountain sulphur               | <i>Colias occidentalis pseudochristina</i> | 6             |
| insect   | arrowhead spiketail                 | <i>Cordulegaster obliqua</i>               | 9             |
| insect   | Sarracenia spiketail                | <i>Cordulegaster sarracenia</i>            | 8             |
| insect   | yellow-headed lichen moth           | <i>Crambidia cephalica</i>                 | 9             |
| insect   | eastern tailed blue                 | <i>Cupido comyntas</i>                     | 6             |
| insect   | unexpected tiger moth               | <i>Cycnia inopinatus</i>                   | 9             |
| insect   | Parker's cilloepus riffle beetle    | <i>Cylloepus parkeri</i>                   | 3             |
| insect   | gemmed satyr                        | <i>Cyllopsis gemma</i>                     | 9             |
| insect   | Chiricahua water scavenger beetle   | <i>Cymbiodyta arizonica</i>                | 3             |
| insect   | monarch butterfly                   | <i>Danaus plexippus plexippus</i>          | 2, 5, 8, 9    |
| insect   | a mayfly                            | <i>Dannella lita</i>                       | 9             |

| Category | Common Name                        | Scientific Name                        | Regions found |
|----------|------------------------------------|--|---------------|
| insect   | a leafhopper                       | <i>Deltocephalus gnarum</i>            | 9             |
| insect   | a noctuid moth                     | <i>Dichagyris reliqua</i>              | 9             |
| insect   | three-lined angle moth             | <i>Digrammia eremiata</i>              | 9             |
| insect   | Kansas preacher leafhopper         | <i>Dorydiella kansana</i>              | 9             |
| insect   | taiga alpine                       | <i>Erebia mancinus</i>                 | 9             |
| insect   | velvet-striped grasshopper         | <i>Eritettix simplex</i>               | 9             |
| insect   | early hairstreak                   | <i>Erora laeta</i>                     | 8, 9          |
| insect   | dashed ringtail                    | <i>Erpetogomphus heterodon</i>         | 3             |
| insect   | columbine duskywing                | <i>Erynnis lucilius</i>                | 9             |
| insect   | mottled duskywing                  | <i>Erynnis martialis</i>               | 8, 9          |
| insect   | Persius duskywing                  | <i>Erynnis persius persius</i>         | 8, 9          |
| insect   | Milne's looper moth                | <i>Euchlaena milnei</i>                | 8, 9          |
| insect   | a moth                             | <i>Eucosma bipunctella</i>             | 9             |
| insect   | a moth                             | <i>Eucosma rusticana</i>               | 9             |
| insect   | a moth                             | <i>Euhyparpax rosea</i>                | 3             |
| insect   | Pinaleno monkey grasshopper        | <i>Eumorsea pinaleno</i>               | 3             |
| insect   | dark blue                          | <i>Euphilotes ancilla purpura</i>      | 4             |
| insect   | vernal blue butterfly              | <i>Euphilotes battoides vernalis</i>   | 5             |
| insect   | Pratt's blue butterfly             | <i>Euphilotes enoptes cryptorufes</i>  | 5             |
| insect   | Dammer's blue butterfly            | <i>Euphilotes enoptes dammersi</i>     | 5             |
| insect   | Morand's checkerspot               | <i>Euphydryas anicia morandi</i>       | 4             |
| insect   | Bing's checkerspot butterfly       | <i>Euphydryas editha bingi</i>         | 5             |
| insect   | Ehrlich's checkerspot butterfly    | <i>Euphydryas editha ehrlichi</i>      | 5             |
| insect   | Karin's checkerspot butterfly      | <i>Euphydryas editha karinae</i>       | 5             |
| insect   | Gillette's checkerspot             | <i>Euphydryas gillettii</i>            | 6             |
| insect   | dion skipper                       | <i>Euphyes dion</i>                    | 1             |
| insect   | green pitcher plant                | <i>Exyra ridingsii</i>                 | 8             |
| insect   | a mayfly                           | <i>Fallceon eatoni</i>                 | 3             |
| insect   | a caddisfly                        | <i>Farula constricta</i>               | 6             |
| insect   | Robertson's flightless planthopper | <i>Fitchiella robertsonii</i>          | 9             |
| insect   | a leafhopper                       | <i>Flexamia reflexus</i>               | 9             |
| insect   | wet sand savannah moth             | <i>Gabara subnivosella</i>             | 9             |
| insect   | arrowhead blue butterfly           | <i>Glaucopteryx piasus sagittegera</i> | 5             |
| insect   | a caddisfly                        | <i>Goera stylata</i>                   | 9             |
| insect   | mustached clubtail                 | <i>Gomphus adelphus</i>                | 9             |
| insect   | Cherokee clubtail                  | <i>Gomphus consanguis</i>              | 8             |
| insect   | harpoon clubtail                   | <i>Gomphus descriptus</i>              | 9             |
| insect   | Columbia clubtail                  | <i>Gomphus lynnae</i>                  | 6             |
| insect   | rapids clubtail                    | <i>Gomphus quadricolor</i>             | 9             |
| insect   | sable clubtail                     | <i>Gomphus rogersi</i>                 | 9             |
| insect   | green-faced clubtail               | <i>Gomphus viridifrons</i>             | 8, 9          |
| insect   | golden hairstreak                  | <i>Habrodais grunus</i>                | 6             |
| insect   | a noctuid moth                     | <i>Hadena ectypa</i>                   | 9             |
| insect   | Chukcho stonefly                   | <i>Haploperla chukcho</i>              | 8             |

| Category | Common Name                                 | Scientific Name                       | Regions found |
|----------|---|---------------------------------------|---------------|
| insect   | Uhler's sundragon                           | <i>Helocordulia uhleri</i>            | 9             |
| insect   | Oregon branded skipper                      | <i>Hesperia colorado oregonia</i>     | 6             |
| insect   | cobweb skipper                              | <i>Hesperia metea</i>                 | 9             |
| insect   | ottoe skipper                               | <i>Hesperia ottoe</i>                 | 1, 2, 9       |
| insect   | Wakulla Springs vari-colored microcaddisfly | <i>Hydroptila wakulla</i>             | 8             |
| insect   | pink prominent                              | <i>Hyparpax aurora</i>                | 9             |
| insect   | arrowhead stripetail                        | <i>Isoperla sagittate</i>             | 8             |
| insect   | "gila" mayfly                               | <i>Lachlania dencyanna</i>            | 3             |
| insect   | a caddisfly                                 | <i>Lepidostoma apache</i>             | 3             |
| insect   | southern pygmy clubtail                     | <i>Lanthus vernalis</i>               | 9             |
| insect   | a caddisfly                                 | <i>Lepidostoma knulli</i>             | 3             |
| insect   | hill-prairie spittlebug                     | <i>Lepyronia gibbose</i>              | 9             |
| insect   | eyed brown                                  | <i>Lethe eurydice</i>                 | 9             |
| insect   | a moth                                      | <i>Leucania extincta</i>              | 9             |
| insect   | Schoolhouse Springs leuctran stonefly       | <i>Leuctra szczytkoi</i>              | 8             |
| insect   | purple skimmer                              | <i>Libellula jesseana</i>             | 8             |
| insect   | a caddisfly                                 | <i>Limnephilus granti</i>             | 3             |
| insect   | lustrous copper                             | <i>Lycaena cupreus</i>                | 6             |
| insect   | Ferris' copper                              | <i>Lycaena ferrisi</i>                | 3             |
| insect   | bronze copper                               | <i>Lycaena hyllus</i>                 | 9             |
| insect   | Makah copper                                | <i>Lycaena mariposa charlottensis</i> | 6             |
| insect   | a heptageniid mayfly                        | <i>Maccaffertium bednariki</i>        | 9             |
| insect   | a leafhopper                                | <i>Macrosteles potorius</i>           | 9             |
| insect   | Blatchley's walking stick                   | <i>Manomera blatcheyi</i>             | 9             |
| insect   | a limnephilid caddisfly                     | <i>Manophylax butleri</i>             | 8             |
| insect   | Smokies needlefly                           | <i>Megaleuctra williamsae</i>         | 8             |
| insect   | little brown cicada                         | <i>Melampsalta calliope</i>           | 9             |
| insect   | a spur-throated grasshopper                 | <i>Melanoplus morsei</i>              | 9             |
| insect   | Ocala clawcercus grasshopper                | <i>Melanoplus nanciae</i>             | 8             |
| insect   | Newman's brocade                            | <i>Meropleon ambifusca</i>            | 9             |
| insect   | helianthus leafhopper                       | <i>Mesamia stramineus</i>             | 9             |
| insect   | a mayfly                                    | <i>Moribaetis mimbresaurus</i>        | 3             |
| insect   | Wahkeena Falls flightless stonefly          | <i>Nanonemoura wahkeena</i>           | 6             |
| insect   | Columbia Gorge caddisfly                    | <i>Neothremma andersoni</i>           | 6             |
| insect   | crepitating conehead katydid                | <i>Neoconocephalus robustus</i>       | 9             |
| insect   | a caddisfly                                 | <i>Neothremma prolata</i>             | 6             |
| insect   | Yuma skipper                                | <i>Ochlodes yuma</i>                  | 6             |
| insect   | contorted ochrotrichian micro caddisfly     | <i>Ochrotrichia contorta</i>          | 9             |
| insect   | Susan's purse making caddisfly              | <i>Ochrotrichia susanae</i>           | 2             |
| insect   | Chryxus arctic                              | <i>Oeneis chryxus</i>                 | 9             |
| insect   | Olympic arctic                              | <i>Oeneis chryxus valerate</i>        | 6             |

| Category | Common Name                          | Scientific Name                      | Regions found |
|----------|--------------------------------------|--------------------------------------|---------------|
| insect   | Melissa arctic                       | <i>Oeneis melissa</i>                | 6             |
| insect   | White Mountain butterfly             | <i>Oeneis melissa semidea</i>        | 9             |
| insect   | a noctuid moth                       | <i>Oncocnemis saundersiana</i>       | 9             |
| insect   | a springtail                         | <i>Onychiurus casus</i>              | 9             |
| insect   | extra-striped snaketail              | <i>Ophiogomphus anomalus</i>         | 9             |
| insect   | Edmund's snaketail                   | <i>Ophiogomphus edmodo</i>           | 8             |
| insect   | pygmy snaketail                      | <i>Ophiogomphus howei</i>            | 8, 9          |
| insect   | Appalachian snaketail                | <i>Ophiogomphus incurvatus</i>       | 8             |
| insect   | Maine snaketail                      | <i>Ophiogomphus mainensis</i>        | 9             |
| insect   | Westfall's snaketail                 | <i>Ophiogomphus westfalli</i>        | 9             |
| insect   | Nearctic paduniellan caddisfly       | <i>Paduniella neartic</i>            | 8             |
| insect   | yellow stoneroot borer               | <i>Papaipema astute</i>              | 9             |
| insect   | blazing stat stem borer              | <i>Papaipema beeriana</i>            | 9             |
| insect   | rattlesnake-master borer moth        | <i>Papaipema eryngii</i>             | 9             |
| insect   | Culvers root borer                   | <i>Papaipema sciata</i>              | 9             |
| insect   | silphius borer moth                  | <i>Papaipema silphia</i>             | 8             |
| insect   | a leafhopper                         | <i>Paraphlepsius particolor</i>      | 9             |
| insect   | a leafhopper                         | <i>Paraphlepsius solidaginis</i>     | 9             |
| insect   | stinging rose caterpillar moth       | <i>Parasa indetermina</i>            | 9             |
| insect   | Young's deepdigger scarab            | <i>Peltotrupes youngi</i>            | 8             |
| insect   | Leona's little blue butterfly        | <i>Philotiella leona</i>             | 6             |
| insect   | tawny crescent                       | <i>Phycoides batessii</i>            | 1, 9          |
| insect   | a planthopper                        | <i>Phylloscelis pallescens</i>       | 9             |
| insect   | West Virginia white                  | <i>Pieris virginiensis</i>           | 9             |
| insect   | a planthopper                        | <i>Pissinotus brunneus</i>           | 9             |
| insect   | San Emigdio blue butterfly           | <i>Plebejus emigdionis</i>           | 5             |
| insect   | Puget blue                           | <i>Plebejus icaroides blackmorei</i> | 6             |
| insect   | Nabokov's blue                       | <i>Plebejus idas nabokovi</i>        | 9             |
| insect   | lupine blue butterfly                | <i>Plebejus lupini spangelatus</i>   | 6             |
| insect   | gray-blue butterfly                  | <i>Plebejus podarce klamathensis</i> | 6             |
| insect   | San Gabriel Mountains blue butterfly | <i>Plebejus saepiolus aureoles</i>   | 5             |
| insect   | coastal greenish blue butterfly      | <i>Plebejus saepiolus littoralis</i> | 6             |
| insect   | white-streaked looper moth           | <i>Plusia venusta</i>                | 9             |
| insect   | mulberry wing                        | <i>Poanes massasoit</i>              | 1             |
| insect   | broad-winged skipper                 | <i>Poanes viator</i>                 | 1             |
| insect   | Mardon skipper                       | <i>Polites mardon</i>                | 5, 6          |
| insect   | Peck's skipper                       | <i>Polites peckius</i>               | 6             |
| insect   | tawny-edged skipper                  | <i>Polites themistocles</i>          | 6             |
| insect   | short-winged polyamia                | <i>Polyamia brevipennis</i>          | 9             |
| insect   | prairie bunchgrass leafhopper        | <i>Polyamia herbida</i>              | 9             |
| insect   | Smyth's green comma                  | <i>Polygonia faunus smythi</i>       | 9             |
| insect   | Kansas prairie leafhopper            | <i>Prairiana kansana</i>             | 9             |
| insect   | Balmorhea saddle-case caddisfly      | <i>Protophila balmorhea</i>          | 3             |
| insect   | Avernus Cave beetle                  | <i>Pseudanophthalmus avernus</i>     | 8             |

| Category | Common Name                      | Scientific Name                         | Regions found |
|----------|----------------------------------|---|---------------|
| insect   | Little Kennedy Cave beetle       | <i>Pseudanophthalmus cordicollis</i>    | 8             |
| insect   | Greenbrier Cave beetle           | <i>Pseudanophthalmus fuscus</i>         | 9             |
| insect   | Timber Ridge cave beetle         | <i>Pseudanophthalmus hadenoecus</i>     | 9             |
| insect   | Martha's Cave beetle             | <i>Pseudanophthalmus hypertrichosis</i> | 9             |
| insect   | Crossroads Cave beetle           | <i>Pseudanophthalmus intersectus</i>    | 8             |
| insect   | Dry Fork Valley cave beetle      | <i>Pseudanophthalmus montanus</i>       | 9             |
| insect   | Patton Cave ground beetle        | <i>Pseudanophthalmus sp. 33</i>         | 9             |
| insect   | Marengo Cave ground beetle       | <i>Pseudanophthalmus stricticollis</i>  | 9             |
| insect   | Young's cave ground beetle       | <i>Pseudanophthalmus youngi</i>         | 9             |
| insect   | Gandy Creek cave beetle          | <i>Pseudosinella certa</i>              | 9             |
| insect   | a springtail                     | <i>Pseudosinella Espana</i>             | 9             |
| insect   | a cave springtail                | <i>Pseudosinella fonsa</i>              | 9             |
| insect   | a springtail                     | <i>Pseudosinella gisini</i>             | 9             |
| insect   | a caddisfly                      | <i>Psychoronia brooksi</i>              | 3             |
| insect   | southern purple mint moth        | <i>Pyrausta laticlavia</i>              | 9             |
| insect   | Freija's grizzled skipper        | <i>Pyrgus centaureae freija</i>         | 9             |
| insect   | Appalachian grizzled skipper     | <i>Pyrgus wyandot</i>                   | 8, 9          |
| insect   | a caddisfly                      | <i>Rhyacophila chandleri</i>            | 6             |
| insect   | Haddock's rhyacophilan caddisfly | <i>Rhyacophila hadocki</i>              | 6             |
| insect   | a caddisfly                      | <i>Rhyacophila leechi</i>               | 6             |
| insect   | a planthopper                    | <i>Rhynchomitra recurve</i>             | 9             |
| insect   | colorful nymph                   | <i>Scaphoideus productus</i>            | 9             |
| insect   | jaguar flower moth               | <i>Schinia jaguarina</i>                | 9             |
| insect   | a springtail                     | <i>Sinella agna</i>                     | 9             |
| insect   | wingless winged cave springtail  | <i>Sinella alata</i>                    | 9             |
| insect   | cavernicolous springtail         | <i>Sinella cavernarum</i>               | 9             |
| insect   | Quebec emerald                   | <i>Somatochlora brevicincta</i>         | 9             |
| insect   | Calvert's emerald                | <i>Somatochlora calverti</i>            | 8             |
| insect   | ski-tipped emerald               | <i>Somatochlora elongate</i>            | 9             |
| insect   | forcipate emerald                | <i>Somatochlora forcipate</i>           | 9             |
| insect   | delicate emerald                 | <i>Somatochlora franklini</i>           | 6             |
| insect   | Hudsonian emerald                | <i>Somatochlora hudsonica</i>           | 2             |
| insect   | incurvate emerald                | <i>Somatochlora incurvate</i>           | 9             |
| insect   | mocha emerald                    | <i>Somatochlora linearis</i>            | 9             |
| insect   | Texas emerald                    | <i>Somatochlora margarita</i>           | 8             |
| insect   | Ozark emerald                    | <i>Somatochlora ozarkensis</i>          | 9             |
| insect   | Whitehouse emerald               | <i>Somatochlora whitehousei</i>         | 6             |
| insect   | coronis fritillary               | <i>Speyeria coronis coronis</i>         | 6             |
| insect   | Diana fritillary                 | <i>Speyeria diana</i>                   | 9             |
| insect   | Great Basin fritillary           | <i>Speyeria egleis</i>                  | 6             |

| Category | Common Name                                  | Scientific Name                             | Regions found |
|----------|--|---|---------------|
| insect   | Tehachapi fritillary butterfly               | <i>Speyeria egleis tehachapina</i>          | 5             |
| insect   | regal fritillary                             | <i>Speyeria idalia</i>                      | 1, 2, 8       |
| insect   | nokomis fritillary                           | <i>Speyeria nokomis nokomis</i>             | 2             |
| insect   | valley silverspot                            | <i>Speyeria zerene bremnerii</i>            | 6             |
| insect   | Clemen's sphinx                              | <i>Sphinx luscitiosa</i>                    | 9             |
| insect   | Bonita diving beetle                         | <i>Stictotarusus neomexicana</i>            | 3             |
| insect   | elusive clubtail                             | <i>Stylurus notatus</i>                     | 9             |
| insect   | zebra clubtail                               | <i>Stylurus scudderii</i>                   | 9             |
| insect   | cryptic willowfly                            | <i>Taeniopteryx nelson</i>                  | 8             |
| insect   | a leafhopper                                 | <i>Texananus longipennis</i>                | 9             |
| insect   | Lake Huron locust                            | <i>Trimerotropis huroniana</i>              | 9             |
| insect   | ebony boghaunter                             | <i>Williamsonia fletcheri</i>               | 9             |
| insect   | ringed boghaunter                            | <i>Williamsonia lintneri</i>                | 9             |
| insect   | a caddisfly                                  | <i>Wormaldia planae</i>                     | 3             |
| insect   | Okefenokee zale moth                         | <i>Zale perculata</i>                       | 8             |
| mammal   | moose  | <i>Alces americanus</i>                     | 9             |
| mammal   | pallid bat                                   | <i>Antrozous pallidus</i>                   | 1, 5, 6       |
| mammal   | Oregon red tree vole                         | <i>Arborimus longicaudus</i>                | 6             |
| mammal   | northern pygmy mouse                         | <i>Baiomys taylori ater</i>                 | 3             |
| mammal   | pygmy rabbit                                 | <i>Brachylagus idahoensis</i>               | 1, 4, 5, 6    |
| mammal   | gray wolf                                    | <i>Canis lupus</i>                          | 1, 4          |
| mammal   | Mexican long-tongued bat                     | <i>Choeronycteris Mexicana</i>              | 3             |
| mammal   | American hognose skunk                       | <i>Conepatus leuconotus</i>                 | 2             |
| mammal   | Rafinesque's big-eared bat                   | <i>Corynorhinus rafinesquii</i>             | 8             |
| mammal   | Townsend's big-eared bat                     | <i>Corynorhinus townsendii</i>              | 1, 2, 5, 6    |
| mammal   | pale Townsend's big-eared bat                | <i>Corynorhinus townsendii pallescens</i>   | 3             |
| mammal   | Townsend's western big-eared bat             | <i>Corynorhinus townsendii townsendii</i>   | 4             |
| mammal   | Gunnison's prairie dog                       | <i>Cynomys gunnisoni</i>                    | 2, 3          |
| mammal   | Gunnison's prairie dog (montane population)  | <i>Cynomys gunnisoni pop. 1</i>             | 3             |
| mammal   | white-tailed prairie dog                     | <i>Cynomys leucurus</i>                     | 2             |
| mammal   | black-tailed prairie dog                     | <i>Cynomys ludovicianus</i>                 | 1, 2          |
| mammal   | Houserock Valley chisel toothed kangaroo rat | <i>Dipodomys microps leucotis</i>           | 3             |
| mammal   | big brown bat                                | <i>Eptesicus fiscus</i>                     | 9             |
| mammal   | spotted bat                                  | <i>Euderma maculatum</i>                    | 1, 2, 3, 4, 6 |
| mammal   | northern flying squirrel                     | <i>Glaucomys sabrinus</i>                   | 9             |
| mammal   | San Bernardino flying squirrel               | <i>Glaucomys sabrinus californicus</i>      | 5             |
| mammal   | Virginia northern flying squirrel            | <i>Glaucomys sabrinus fuscus</i>            | 8, 9          |
| mammal   | wolverine                                    | <i>Gulo gulo luscus</i>                     | 1, 2, 5, 6    |
| mammal   | White Mountains ground squirrel              | <i>Ictidomys tridecemlineatus monticola</i> | 3             |



| Category | Common Name                      | Scientific Name                            | Regions found |
|----------|----------------------------------|--|---------------|
| mammal   | Allen's lappet-crowned bat       | <i>Idionycteris phyllotis</i>              | 3             |
| mammal   | western red bat                  | <i>Lasiurus blossevillii</i>               | 3             |
| mammal   | hoary bat                        | <i>Lasiurus cinereus</i>                   | 2             |
| mammal   | western yellow bat               | <i>Lasiurus xanthinus</i>                  | 3             |
| mammal   | river otter                      | <i>Lontra canadensis</i>                   | 2             |
| mammal   | Olympic marmot                   | <i>Marmota Olympus</i>                     | 6             |
| mammal   | American marten                  | <i>Martes americana</i>                    | 2, 9          |
| mammal   | Pacific marten                   | <i>Martes caurina</i>                      | 5, 6          |
| mammal   | fisher                           | <i>Martes pennanti</i>                     | 1, 4          |
| mammal   | hooded skunk                     | <i>Mephitis macroura milleri</i>           | 3             |
| mammal   | southern rock vole               | <i>Microtus chrotorrhinus carolinensis</i> | 9             |
| mammal   | white-bellied long-tailed vole   | <i>Microtus longicaudus leucophaeus</i>    | 3             |
| mammal   | Navajo Mogollon vole             | <i>Microtus mogollonensis Navaho</i>       | 3             |
| mammal   | Arizona montane vole             | <i>Microtus montanus arizonensis</i>       | 3             |
| mammal   | water vole                       | <i>Microtus richardsoni</i>                | 2             |
| mammal   | southeastern myotis              | <i>Myotis austroriparius</i>               | 8, 9          |
| mammal   | long-eared myotis                | <i>Myotis evotis</i>                       | 1             |
| mammal   | Keen's myotis                    | <i>Myotis keenii</i>                       | 6             |
| mammal   | eastern small-footed myotis      | <i>Myotis leibii</i>                       | 8, 9          |
| mammal   | little brown myotis              | <i>Myotis lucifugus</i>                    | 6, 9          |
| mammal   | fringed myotis                   | <i>Myotis thysanodes</i>                   | 1, 2, 5, 6    |
| mammal   | long-legged myotis               | <i>Myotis volans</i>                       | 1             |
| mammal   | White Mountains chipmunk         | <i>Neotamias minimus arizonensis</i>       | 3             |
| mammal   | Penasco least chipmunk           | <i>Neotamias minimus atristriatus</i>      | 3             |
| mammal   | red-tailed chipmunk              | <i>Neotamias ruficaudus</i>                | 6             |
| mammal   | Allegheny woodrat                | <i>Neotoma magister</i>                    | 9             |
| mammal   | evening bat                      | <i>Nycticeius humeralis</i>                | 9             |
| mammal   | mountain goat                    | <i>Oreamnos americanus</i>                 | 6             |
| mammal   | bighorn sheep                    | <i>Ovis canadensis</i>                     | 1, 4, 6       |
| mammal   | Rocky Mountain bighorn sheep     | <i>Ovis canadensis canadensis</i>          | 2, 4          |
| mammal   | desert bighorn sheep             | <i>Ovis canadensis nelsoni</i>             | 2, 4, 5       |
| mammal   | tri-colored bat                  | <i>Perimyotis subflavus</i>                | 8, 9          |
| mammal   | white-eared pocket mouse         | <i>Perognathus alticolus alticolus</i>     | 5             |
| mammal   | Tehachapi pocket mouse           | <i>Perognathus alticolus inexpectus</i>    | 5             |
| mammal   | Springerville silky pocket mouse | <i>Perognathus flavus goodpasteri</i>      | 3             |
| mammal   | Great Basin pocket mouse         | <i>Perognathus parvus</i>                  | 1             |
| mammal   | mesquite mouse                   | <i>Peromyscus merriami</i>                 | 3             |

| Category | Common Name                        | Scientific Name                         | Regions found |
|----------|------------------------------------|---|---------------|
| mammal   | eastern heather vole               | <i>Phenacomys ungava</i>                | 9             |
| mammal   | Florida mouse                      | <i>Podomys floridanus</i>               | 8             |
| mammal   | Arizona gray squirrel              | <i>Sciurus arizonensis arizonensis</i>  | 3             |
| mammal   | western gray squirrel              | <i>Sciurus griseus</i>                  | 6             |
| mammal   | Chiricahua fox squirrel            | <i>Sciurus nayaritensis chiricahuae</i> | 3             |
| mammal   | Sherman's fox squirrel             | <i>Sciurus niger shermani</i>           | 8             |
| mammal   | Arizona shrew                      | <i>Sorex arizonae</i>                   | 3             |
| mammal   | long-tailed shrew                  | <i>Sorex dispar</i>                     | 9             |
| mammal   | pygmy shrew                        | <i>Sorex hoyi</i>                       | 2, 6          |
| mammal   | western water shrew                | <i>Sorex navigator</i>                  | 3             |
| mammal   | New Mexico shrew                   | <i>Sorex neomexicanus</i>               | 3             |
| mammal   | southern water shrew               | <i>Sorex palustris punctulatus</i>      | 9             |
| mammal   | Preble's shrew                     | <i>Sorex preblei</i>                    | 6             |
| mammal   | southern Idaho ground squirrel     | <i>Spermophilus brunneus endemicus</i>  | 4             |
| mammal   | Franklin's ground squirrel         | <i>Spermophilus franklinii</i>          | 9             |
| mammal   | eastern spotted skunk              | <i>Spilogale putorius</i>               | 9             |
| mammal   | plains spotted skunk               | <i>Spilogale putorius interrupta</i>    | 9             |
| mammal   | Appalachian cottontail             | <i>Sylvilagus obscurus</i>              | 9             |
| mammal   | northern bog lemming               | <i>Synaptomys borealis</i>              | 1, 9          |
| mammal   | southern bog lemming               | <i>Synaotomys cooperi</i>               | 9             |
| mammal   | Mount Pinos lodgepole chipmunk     | <i>Tamias speciosus callipeplus</i>     | 5             |
| mammal   | Guadalupe pocket gopher            | <i>Thomomys bottae guadalupensis</i>    | 3             |
| mammal   | Wyoming pocket gopher              | <i>Thomomys clusius</i>                 | 2             |
| mammal   | Louisiana black bear               | <i>Ursus americanus luteolus</i>        | 8             |
| mammal   | kit fox                            | <i>Vulpes macrotis</i>                  | 2             |
| mammal   | swift fox                          | <i>Vulpes velox</i>                     | 2             |
| mammal   | Cascade red fox                    | <i>Vulpes vulpes cascadenis</i>         | 6             |
| mammal   | Sierra Nevada red fox              | <i>Vulpes vulpes necator</i>            | 5, 6          |
| myriapod | Bollman's Cave millipede           | <i>Conotyia bollmani</i>                | 9             |
| myriapod | a millipede                        | <i>Ergodesmus remingtoni</i>            | 9             |
| myriapod | montane centipede                  | <i>Escaryus cryptorobius</i>            | 8             |
| myriapod | White Mountain centipede           | <i>Escaryus orestes</i>                 | 8             |
| myriapod | a cave obligate millipede          | <i>Pseudotremia indianae</i>            | 9             |
| myriapod | Germany Valley cave millipede      | <i>Pseudotremia lusciosa</i>            | 9             |
| myriapod | South Branch Valley cave millipede | <i>Pseudotremia princeps</i>            | 9             |
| myriapod | Reynold's cave millipede           | <i>Pseudotremia reynoldsae</i>          | 9             |
| myriapod | a cave obligate millipede          | <i>Pseudotremia salisae</i>             | 9             |
| myriapod | Grand Caverns blind cave millipede | <i>Trichopetalum weyeriense</i>         | 9             |
| myriapod | Luray Caverns blind cave           | <i>Trichopetalum whitei</i>             | 9             |

| Category | Common Name                        | Scientific Name                            | Regions found |
|----------|------------------------------------|--|---------------|
|          | millipede                          |  |               |
| myriapod | West Virginia blind cave millipede | <i>Trichopetalum krekeleri</i>             | 9             |
| reptile  | western pond turtle                | <i>Actinemys marmorata</i>                 | 5, 6          |
| reptile  | California legless lizard          | <i>Anniella pulchra</i>                    | 5             |
| reptile  | orange-throated whiptail           | <i>Aspidoscelis hyperythra</i>             | 5             |
| reptile  | giant spotted whiptail             | <i>Aspidoscelis stictigrama</i>            | 3             |
| reptile  | red-backed whiptail                | <i>Aspidoscelis xanthonota</i>             | 3             |
| reptile  | southern rubber boa                | <i>Charina umbratica</i>                   | 5             |
| reptile  | painted turtle                     | <i>Chrysemys picta</i>                     | 6             |
| reptile  | spotted turtle                     | <i>Clemmys guttata</i>                     | 8, 9          |
| reptile  | Kirtland's snake                   | <i>Clonophis kirtlandii</i>                | 9             |
| reptile  | eastern diamondback rattlesnake    | <i>Crotalus adamanteus</i>                 | 8             |
| reptile  | timber rattlesnake                 | <i>Crotalus horridus</i>                   | 9             |
| reptile  | mottled rock rattlesnake           | <i>Crotalus lepidus lepidus</i>            | 3             |
| reptile  | red diamond rattlesnake            | <i>Crotalus ruber ruber</i>                |               |
| reptile  | twin-spotted rattlesnake           | <i>Crotalus pricei</i>                     | 3             |
| reptile  | Arizona ridgenose rattlesnake      | <i>Crotalus willardi willardi</i>          | 3             |
| reptile  | ringneck snake                     | <i>Diadophis punctatus</i>                 | 1             |
| reptile  | San Bernardino ringneck snake      | <i>Diadophis punctatus modestus</i>        | 5             |
| reptile  | San Diego ringneck snake           | <i>Diadophis punctatus similis</i>         | 5             |
| reptile  | Blanding's turtle                  | <i>Emydoidea blandingii</i>                | 9             |
| reptile  | wood turtle                        | <i>Glyptemys insculpta</i>                 | 8, 9          |
| reptile  | bog turtle                         | <i>Glyptemys muhlenbergii</i>              | 8             |
| reptile  | Sonoran desert tortoise            | <i>Gopherus morafkai</i>                   | 3             |
| reptile  | gopher tortoise                    | <i>Gopherus polyphemus</i>                 | 8             |
| reptile  | Barbour's map turtle               | <i>Graptemys barbouri</i>                  | 8             |
| reptile  | thornscrub hook-nosed snake        | <i>Gyalopion quadrangulare</i>             | 3             |
| reptile  | southern hognose snake             | <i>Heterodon simus</i>                     | 8             |
| reptile  | California mountain kingsnake      | <i>Lampropeltis zonata</i>                 | 6             |
| reptile  | San Bernardino mountain kingsnake  | <i>Lampropeltis zonata parvirubra</i>      | 5             |
| reptile  | San Diego mountain kingsnake       | <i>Lampropeltis zonata pulchra</i>         | 5             |
| reptile  | Coastal rosy boa                   | <i>Lichanura orcutti</i>                   | 5             |
| reptile  | alligator snapping turtle          | <i>Macrochelys temminckii</i>              | 9             |
| reptile  | Mississippi green watersnake       | <i>Nerodia cyclopion</i>                   | 9             |
| reptile  | brown vinesnake                    | <i>Oxybelis aeneus</i>                     | 3             |
| reptile  | pine snake                         | <i>Pituophis melanoleucus</i>              | 8             |
| reptile  | mountain skink                     | <i>Plestidon callicephalus</i>             | 3             |
| reptile  | Slevin's bunchgrass lizard         | <i>Sceloporus slevini</i>                  | 3             |
| reptile  | Florida scrub lizard               | <i>Sceloporus woodi</i>                    | 8             |
| reptile  | green ratsnake                     | <i>Senticolis triaspis</i>                 | 3             |
| reptile  | desert massasauga rattlesnake      | <i>Sistrus tergeminus edwardsii</i>        | 2             |
| reptile  | Black Hills redbelly snake         | <i>Storeria occipitomaculata pahasapae</i> | 2             |
| reptile  | flat-headed snake                  | <i>Tantilla gracilis</i>                   | 9             |

| Category | Common Name                   | Scientific Name                       | Regions found |
|----------|-------------------------------|---------------------------------------|---------------|
| reptile  | Chihuahaun black-headed snake | <i>Tantilla wilcoxi</i>               | 3             |
| reptile  | Yaqui black-headed snake      | <i>Tantilla yaquia</i>                | 3             |
| reptile  | eastern box turtle            | <i>Terrapene carolina carolina</i>    | 9             |
| reptile  | two-striped garter snake      | <i>Thamnophis hammondi</i>            | 5             |
| reptile  | arid land ribbonsnake         | <i>Thamnophis proximus diabolicus</i> | 3             |
| reptile  | mountain earth snake          | <i>Virginia valeriae pulchra</i>      | 9             |
| reptile  | Bezy's night lizard           | <i>Xantusia bezyi</i>                 | 3             |

## Appendix B: Retardant Application Potential

Retardant application potential for each forest and identification of those forests where retardant is used on more than 0.01 percent of the land base annually, based upon 2012 to 2019 retardant use data.

| Region | Forest                              | Retardant Application Potential | Is retardant used on more than 0.01 percent of land base annually? |
|--------|-------------------------------------|---------------------------------|--|
| 1      | Beaverhead-Deerlodge                | moderate                        | No   |
| 1      | Bitterroot                          | moderate                        | No   |
| 1      | Custer Gallatin                     | low                             | No   |
| 1      | Dakota Prairie grasslands           | very low                        | No   |
| 1      | Flathead                            | very low                        | No   |
| 1      | Helena-Lewis and Clark              | moderate                        | Yes  |
| 1      | Idaho-Panhandle                     | moderate                        | No   |
| 1      | Kootenai                            | moderate                        | No   |
| 1      | Lolo                                | high                            | Yes  |
| 1      | Nez Perce - Clearwater              | high                            | No   |
| 2      | Arapaho & Roosevelt                 | low                             | No   |
| 2      | Bighorn                             | very low                        | No   |
| 2      | Black Hills                         | very low                        | No   |
| 2      | Grand Mesa Uncompahgre and Gunnison | very low                        | No   |
| 2      | Medicine Bow-Routt                  | moderate                        | No   |
| 2      | Nebraska                            | very low                        | No   |
| 2      | Pike and San Isabel                 | moderate                        | No   |
| 2      | Rio Grande                          | very low                        | No   |
| 2      | San Juan                            | moderate                        | No   |
| 2      | Shoshone                            | moderate                        | No   |
| 2      | White River                         | moderate                        | No   |

| <b>Region</b> | <b>Forest</b>       | <b>Retardant Application Potential</b> | <b>Is retardant used on more than 0.01 percent of land base annually?</b> |
|---------------|---------------------|--|---|
| 3             | Apache-Sitgreaves   | low                                    | No  |
| 3             | Carson              | very low                               | No  |
| 3             | Cibola              | moderate                               | Yes   |
| 3             | Coconino            | moderate                               | No  |
| 3             | Coronado            | high                                   | Yes   |
| 3             | Gila                | moderate                               | No  |
| 3             | Kaibab              | very low                               | No  |
| 3             | Lincoln             | moderate                               | Yes   |
| 3             | Prescott            | high                                   | Yes   |
| 3             | Santa Fe            | moderate                               | No  |
| 3             | Tonto               | high                                   | Yes   |
| 4             | Ashley              | very low                               | No  |
| 4             | Boise               | high                                   | Yes   |
| 4             | Bridger-Teton       | high                                   | No  |
| 4             | Caribou-Targhee     | very low                               | No  |
| 4             | Dixie               | high                                   | Yes   |
| 4             | Fishlake            | low                                    | No  |
| 4             | Humboldt-Toiyabe    | high                                   | No  |
| 4             | Manti-La Sal        | low                                    | No  |
| 4             | Payette             | high                                   | Yes   |
| 4             | Salmon-Challis      | moderate                               | No  |
| 4             | Sawtooth            | moderate                               | No  |
| 4             | Uinta-Wasatch-Cache | high                                   | Yes   |
| 5             | Angeles             | high                                   | Yes   |
| 5             | Cleveland           | high                                   | Yes   |

| <b>Region</b> | <b>Forest</b>        | <b>Retardant Application Potential</b> | <b>Is retardant used on more than 0.01 percent of land base annually?</b> |
|---------------|----------------------|--|---|
| 5             | Eldorado             | high                                   | Yes   |
| 5             | Inyo                 | high                                   | Yes   |
| 5             | Klamath              | high                                   | Yes   |
| 5             | LTBMU                | very low                               | No  |
| 5             | Lassen               | moderate                               | Yes   |
| 5             | Los Padres           | high                                   | Yes   |
| 5             | Mendocino            | mod                                    | Yes   |
| 5             | Modoc                | high                                   | Yes   |
| 5             | Plumas               | high                                   | Yes   |
| 5             | San Bernardino       | high                                   | Yes   |
| 5             | Sequoia              | high                                   | Yes   |
| 5             | Shasta-Trinity       | high                                   | Yes   |
| 5             | Sierra               | high                                   | Yes   |
| 5             | Six Rivers           | high                                   | Yes   |
| 5             | Stanislaus           | high                                   | Yes   |
| 5             | Tahoe                | high                                   | Yes   |
| 6             | Columbia River Gorge | very low                               | No  |
| 6             | Colville             | low                                    | No  |
| 6             | Deschutes and Ochoco | high                                   | Yes   |
| 6             | Fremont-Winema       | moderate                               | No  |
| 6             | Gifford Pinchot      | low                                    | No  |
| 6             | Malheur              | high                                   | Yes   |
| 6             | Mt. Baker-Snoqualmie | none                                   | No  |
| 6             | Mt Hood              | very low                               | No  |
| 6             | Okanogan-Wenatchee   | high                                   | Yes   |

| <b>Region</b> | <b>Forest</b>                            | <b>Retardant Application Potential</b> | <b>Is retardant used on more than 0.01 percent of land base annually?</b> |
|---------------|--|--|---|
| 6             | Olympic                                  | none                                   | No  |
| 6             | Rogue River-Siskiyou                     | high                                   | Yes   |
| 6             | Siuslaw                                  | none                                   | No  |
| 6             | Umatilla                                 | moderate                               | Yes   |
| 6             | Umpqua                                   | moderate                               | No  |
| 6             | Wallowa-Whitman                          | high                                   | Yes   |
| 6             | Willamette                               | low                                    | No  |
| 8             | Chattahoochee-Oconee                     | very low                               | No  |
| 8             | Cherokee                                 | very low                               | No  |
| 8             | Daniel Boone                             | none                                   | No  |
| 8             | El Yunque                                | none                                   | No  |
| 8             | Francis Marion & Sumter                  | none                                   | No  |
| 8             | George Washington and Jefferson          | none                                   | No  |
| 8             | Kisatchie                                | none                                   | No  |
| 8             | Land Between the Lakes NRA               | none                                   | No  |
| 8             | National Forests in Alabama              | none                                   | No  |
| 8             | National Forests in Florida              | very low                               | No  |
| 8             | National Forests in Mississippi          | none                                   | No  |
| 8             | National Forests and Grasslands in Texas | very low                               | No  |
| 8             | National Forests in North Carolina       | very low                               | No  |
| 8             | Ouachita                                 | none                                   | No  |
| 8             | Ozark-St. Francis                        | none                                   | No  |
| 9             | Allegheny                                | none                                   | No  |
| 9             | Chequamegon-Nicolet                      | none                                   | No  |
| 9             | Chippewa                                 | very low                               | No  |
| 9             | Green Mountain and Finger Lakes          | none                                   | No  |
| 9             | Hiawatha                                 | none                                   | No  |



| <b>Region</b> | <b>Forest</b>  | <b>Retardant Application Potential</b> | <b>Is retardant used on more than 0.01 percent of land base annually?</b> |
|---------------|----------------|--|---|
| 9             | Hoosier        | none                                   | No  |
| 9             | Huron-Manistee | none                                   | No  |
| 9             | Mark Twain     | very low                               | No  |
| 9             | Midewin        | none                                   | No  |
| 9             | Monongahela    | none                                   | No  |
| 9             | Ottawa         | none                                   | No  |
| 9             | Shawnee        | none                                   | No  |
| 9             | Superior       | very low                               | No  |
| 9             | Wayne          | none                                   | No  |
| 9             | White Mountain | none                                   | No  |
| 10            | Chugach        | none                                   | No  |
| 10            | Tongass        | none                                   | No  |

## Appendix C: Intrusion Data (2012 – 2019)

Aerial fire retardant intrusion events<sup>1</sup> into terrestrial avoidance areas, waterways and waterway buffers on National Forest System Lands

| Year         | Number of fires with intrusions | Number of intrusion reports on FS lands <sup>1</sup> | Number of intrusions that enter water | number of intrusions that entered the buffer only | number of intrusions that entered terrestrial TES avoidance areas | Number of accidental intrusions | Number of intrusions due to exception | Total number of fires | Total retardant used (gallons) in year | Estimated number of drops delivered by aircraft (gallons/1800) | Percent of fires with intrusion (%) | Total intrusions divided by estimated drops (%) |
|--------------|---------------------------------|--|---------------------------------------|---|---|---------------------------------|---------------------------------------|-----------------------|--|--|-------------------------------------|---|
| 2012         | 39                              | 72   | 15                                    | 55  | 2   | 52                              | 20                                    | 7725                  | 8,540,914                              | 4745   | 0.50%                               | 1.52%   |
| 2013         | 31                              | 54   | 18                                    | 34  | 2   | 42                              | 12                                    | 7588                  | 12,218,348                             | 6788   | 0.41%                               | 0.80%   |
| 2014         | 31                              | 37   | 16                                    | 20  | 1   | 33                              | 4                                     | 6910                  | 8,896,234                              | 4942   | 0.45%                               | 0.75%   |
| 2015         | 27                              | 50   | 33                                    | 16  | 1   | 40                              | 10                                    | 6835                  | 11,594,937                             | 6442   | 0.40%                               | 0.78%   |
| 2016         | 31                              | 60   | 26                                    | 27  | 7   | 46                              | 14                                    | 5772                  | 19,021,716                             | 10568  | 0.54%                               | 0.57%   |
| 2017         | 35                              | 75   | 48                                    | 24  | 3   | 65                              | 10                                    | 6869                  | 18,943,573                             | 10524  | 0.51%                               | 0.71%   |
| 2018         | 35                              | 88   | 45                                    | 38  | 5   | 76                              | 12                                    | 5739                  | 16,376,813                             | 9098   | 0.61%                               | 0.97%   |
| 2019         | 15                              | 21   | 12                                    | 3   | 6   | 15                              | 6                                     | 5412                  | 6,769,496                              | 3761   | 0.28%                               | 0.56%   |
| <b>TOTAL</b> | <b>244</b>                      | <b>457</b>   | <b>213</b>                            | <b>217</b>  | <b>27</b>   | <b>369</b>                      | <b>88</b>                             | <b>52850</b>          | <b>102,362,031</b>                     | <b>56868</b>   | <b>0.46%</b>                        | <b>0.80%</b>                                    |

## **Appendix D: Species Determinations by Unit**

7-Jul-23

This spreadsheet summarizes the sensitive species determinations by forest and region.

Forests that have completed Forest Plan Revisions under the 2012 Planning Rule no longer have sensitive species. Those Forests have been removed from the lists in each Region. Forests with new Forest Plans under the 2012 Planning Rule include:

Region 1: Flathead (2018), Helena - Lewis and Clark (2021), Custer-Gallatin (2022)

Region 2: Rio Grande (2020)

Region 3: Cibola (2022); Carson (2022); Santa Fe (2022)

Region 5: Inyo (2019); Sierra (2023); Sequoia (2023, not including the Sequoia National Monument)

Region 8: Francis Marion (2017); El Yunque (2019); Nantahala and Pisgah (2023)

Region 10: Chugach (2020)

Notes:

1. Sensitive species are not identified on the 2018 Region 8 sensitive species list for the Francis Marion National Forest because the Forest Plan was completed in 2017.
2. The sensitive species list for the National Forests in North Carolina, which include the Nantahala and Pisgah National Forests, is not broken out by individual forest; therefore the entire species lists is included in
3. The sensitive species list for the Sequoia National Forest is not broken out for the Sequoia National Monument; therefore all species on the Sequoia National Forest list are included in this analysis.

Codes in this spreadsheet:

NI = no impact

MIIH - may impact individuals and habitat but will not lead to a trend in federal listing

WII - may impact individuals and habitat and will lead to a trend in federal listing

| Determinations by Forest per Species Group: | Birds | Mammals | Fish | Bi-valves | Gastropods | Crustaceans | Amphibians | Insects | Reptiles | Arachnids | Annelids | Flatworms | Myriapods |
|---|-------|---------|------|-----------|------------|-------------|------------|---------|----------|-----------|----------|-----------|-----------|
| NI  | 194   | 109     | 102  | 84        | 61         | 59          | 63         | 250     | 36       | 12        | 1        | 6         | 12        |
| MIIH  | 630   | 454     | 285  | 65        | 179        | 27          | 137        | 267     | 85       | 0         | 2        | 0         | 0         |
| WII   |       |         |      |           |            |             |            |         |          |           |          |           |           |

| Category  | Common name               | scientific name                  | Beaverhead-Deerlodge | Bitterroot | Dakota Prairie Grasslands | Idaho-Panhandle | Kootenai | Lolo | Nez-Perce Clearwater |
|-----------|---------------------------|----------------------------------|----------------------|------------|---------------------------|-----------------|----------|------|----------------------|
| amphibian | western toad              | <i>Bufo boreas</i>               | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| amphibian | great plains toad         | <i>Bufo cognatus</i>             |                      |            |                           |                 |          |      |                      |
| amphibian | Cour d'Alene salamander   | <i>Plethodon idahoensis</i>      |                      | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| amphibian | northern leopard frog     | <i>Rana pipiens</i>              |                      | MIIH       |                           |                 | MIIH     | MIIH |                      |
| bird      | Baird's sparrow           | <i>Ammodramus bairdii</i>        |                      |            | MIIH                      |                 |          |      |                      |
| bird      | Sprague's pipit           | <i>Anthus spragueii</i>          |                      |            | MIIH                      |                 |          |      |                      |
| bird      | burrowing owl             | <i>Athene cunicularia</i>        |                      |            | MIIH                      |                 |          |      |                      |
| bird      | greater sage grouse       | <i>Centrocercus urophasianus</i> | MIIH                 |            | MIIH                      |                 |          |      |                      |
| bird      | trumpeter swan            | <i>Cygnus buccinator</i>         | MIIH                 |            |                           |                 |          |      |                      |
| bird      | black swift               | <i>Cypseloides niger</i>         |                      |            |                           | MIIH            |          |      | MIIH                 |
| bird      | American peregrine falcon | <i>Falco peregrinus anatum</i>   | NI                   | NI         |                           | NI              | NI       | MIIH | NI                   |
| bird      | common loon               | <i>Gavia immer</i>               |                      |            |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| bird      | bald eagle                | <i>Haliaeetus leucocephalus</i>  | MIIH                 | MIIH       | MIIH                      | MIIH            | MIIH     | MIIH | MIIH                 |
| bird      | harlequin duck            | <i>Histrionicus histrionicus</i> | MIIH                 |            |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| bird      | loggerhead shrike         | <i>Lanius ludovicianus</i>       |                      |            | MIIH                      |                 |          |      |                      |
| bird      | long-billed curlew        | <i>Numenius americanus</i>       |                      |            | NI                        |                 |          |      | MIIH                 |
| bird      | mountain quail            | <i>Oreortyx pictus</i>           |                      |            |                           |                 |          |      | MIIH                 |
| bird      | flamulated owl            | <i>Otus flammeolus</i>           | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| bird      | white-headed woodpecker   | <i>Picoides albolarvatus</i>     |                      |            |                           |                 |          |      | MIIH                 |
| bird      | black-backed woodpecker   | <i>Picoides arcticus</i>         | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| bird      | pygmy nuthatch            | <i>Sitta pygmaea</i>             |                      |            |                           | MIIH            |          |      | MIIH                 |
| bird      | greater prairie chicken   | <i>Tympanuchus cupido</i>        |                      |            | MIIH                      |                 |          |      |                      |

| Category | Common name              | scientific name                      | Beaverhead-Deerlodge | Bitterroot | Dakota Prairie Grasslands | Idaho-Panhandle | Kootenai | Lolo | Nez-Perce Clearwater |
|----------|--------------------------|--------------------------------------|----------------------|------------|---------------------------|-----------------|----------|------|----------------------|
| bivalve  | western pearlshell       | <i>Margaritifera falcata</i>         | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| fish     | pacific lamprey          | <i>Lampetra tridentata</i>           |                      | MIIH       |                           |                 |          |      | MIIH                 |
| fish     | burbot                   | <i>Lota lota</i>                     |                      |            |                           | MIIH            | MIIH     |      |                      |
| fish     | westslope cutthroat      | <i>Oncorhynchus clarki lewisi</i>    | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| fish     | interior redband         | <i>Oncorhynchus mykiss gairdneri</i> |                      |            |                           | MIIH            | MIIH     |      | MIIH                 |
| fish     | northern redbelly dace   | <i>Phoxinus eos</i>                  |                      |            | MIIH                      |                 |          |      |                      |
| fish     | arctic grayling          | <i>Thymallus arcticus montanus</i>   | MIIH                 |            |                           |                 |          |      |                      |
| insect   | arogos skipper           | <i>Atrytone araogos iowa</i>         |                      |            | MIIH                      |                 |          |      |                      |
| insect   | dion skipper             | <i>Euphyes dion</i>                  |                      |            | NI                        |                 |          |      |                      |
| insect   | otloe skipper            | <i>Hesperis otloe</i>                |                      |            | NI                        |                 |          |      |                      |
| insect   | tawny crescent           | <i>Phycoides batessii</i>            |                      |            | NI                        |                 |          |      |                      |
| insect   | mulberry wing            | <i>Poanes massasoit</i>              |                      |            | NI                        |                 |          |      |                      |
| insect   | broad-winged skipper     | <i>Poanes viator</i>                 |                      |            | NI                        |                 |          |      |                      |
| insect   | regal fritillary         | <i>Speyeria idalia</i>               |                      |            | MIIH                      |                 |          |      |                      |
| mammal   | pygmy rabbit             | <i>Brachylagus idahoensis</i>        | MIIH                 |            |                           |                 |          |      |                      |
| mammal   | gray wolf                | <i>Canis lupus</i>                   | MIIH                 | MIIH       | MIIH                      | MIIH            | MIIH     | MIIH | MIIH                 |
| mammal   | Townsend's big-eared bat | <i>Corynorhinus townsendii</i>       | MIIH                 | MIIH       | MIIH                      | MIIH            | MIIH     | MIIH | MIIH                 |
| mammal   | black-tailed prairie dog | <i>Cynomys ludovicianus</i>          |                      |            | MIIH                      |                 |          |      |                      |
| mammal   | spotted bat              | <i>Euderma maculatum</i>             | MIIH                 |            |                           |                 |          |      |                      |
| mammal   | wolverine                | <i>Gulo gulo luscus</i>              | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |
| mammal   | fisher                   | <i>Martes pennanti</i>               | MIIH                 | MIIH       |                           | MIIH            | MIIH     | MIIH | MIIH                 |

| Category | Common name              | scientific name            | Beaverhead-Deerlodge | Bitterroot | Dakota Prairie Grasslands | Idaho-Panhandle | Kootenai | Lolo | Nez-Perce Clearwater |
|----------|--------------------------|----------------------------|----------------------|------------|---------------------------|-----------------|----------|------|----------------------|
| mammal   | long-eared myotis        | <i>Myotis evotis</i>       |                      |            | MIIH                      |                 |          |      |                      |
| mammal   | fringed myotis           | <i>Myotis thysanodes</i>   |                      |            |                           | MIIH            |          |      | MIIH                 |
| mammal   | long-legged myotis       | <i>Myotis volans</i>       |                      |            | MIIH                      |                 |          |      |                      |
| mammal   | bighorn sheep            | <i>Ovis canadensis</i>     | MIIH                 | MIIH       | MIIH                      |                 | MIIH     | MIIH | MIIH                 |
| mammal   | great basin pocket mouse | <i>Perognathus parvus</i>  | MIIH                 |            |                           |                 |          |      |                      |
| mammal   | northern bog lemming     | <i>Synaptomys borealis</i> | NI                   | NI         |                           | NI              | NI       | NI   |                      |
| reptile  | ringneck snake           | <i>Diadophis punctatus</i> |                      |            |                           |                 |          |      | MIIH                 |

VERSION: 6/27/2023

|           |                            |  | Bighorn | Black Hills | Grand Mesa,<br>Uncompahgre and<br>Gunnison | Medicine Bow-<br>Rout and Thunder<br>Basin NG | Nebraska, Samuel<br>R. McKelvie NFs and<br>Oglala, Buffalo Gap<br>and Fort Pierre NGs | Arapahoe-<br>Roosevelt and<br>Pawnee NG | Pike-San Isabel,<br>Cimmaron<br>Comanche NG | San Juan | Shoshone | White<br>River |
|-----------|----------------------------|--|---------|-------------|--|---|---|---|---|----------|----------|----------------|
| Category  | Common name                | scientific name                              |         |             |  |   |   |   |   |          |          |                |
| amphibian | boreal toad                | <i>Anaxyrus boreas boreas</i>                |         |             | MIIH                                       | MIIH  |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| amphibian | plains leopard frog        | <i>Lithobates blairi</i>                     |         |             |  |   | MIIH  |   | MIIH  |          |          |                |
| amphibian | northern leopard frog      | <i>Lithobates pipiens</i>                    | MIIH    | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| amphibian | wood frog                  | <i>Lithobates sylvatica</i>                  | MIIH    |             |  | MIIH  |   | MIIH                                    |   |          |          |                |
| amphibian | Columbia spotted frog      | <i>Rana luteiventris (Bighorn Mtn. pop.)</i> | NI      |             |  |   |   |   |   |          | MIIH     |                |
| bird      | northern goshawk           | <i>Accipiter gentilis</i>                    | MIIH    | MIIH        | MIIH                                       | MIIH  |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | boreal owl                 | <i>Aegolius funereus</i>                     | MIIH    |             | MIIH                                       | MIIH  |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | grasshopper sparrow        | <i>Ammodramus savannarum</i>                 | MIIH    | MIIH        |  |   | NI  | MIIH                                    | MIIH  | MIIH     | MIIH     |                |
| bird      | sagebrush sparrow          | <i>Artemisiospiza nevadensis</i>             | MIIH    |             | MIIH                                       | MIIH  |   |   | MIIH  | MIIH     |          | MIIH           |
| bird      | short-eared owl            | <i>Asio flammeus</i>                         | MIIH    |             |  |   | MIIH  |   | MIIH  | MIIH     | MIIH     |                |
| bird      | burrowing owl              | <i>Athene cunicularia</i>                    |         | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     |                |
| bird      | American bittern           | <i>Botaurus lentiginosus</i>                 |         |             | MIIH                                       | MIIH  | NI  | MIIH                                    | MIIH  | NI       |          |                |
| bird      | ferruginous hawk           | <i>Buteo regalis</i>                         |         | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | chestnut-collared longspur | <i>Calcarius ornatus</i>                     |         |             |  | MIIH  | MIIH  | MIIH                                    | MIIH  |          |          |                |
| bird      | greater sage-grouse        | <i>Centrocercus urophasianus</i>             | MIIH    |             |  | MIIH  | MIIH  | MIIH                                    |   |          | MIIH     | MIIH           |
| bird      | mountain plover            | <i>Charadrius montanus</i>                   |         | MIIH        |  | MIIH  | MIIH  | MIIH                                    | MIIH  |          | MIIH     |                |
| bird      | black tern                 | <i>Chlidonias niger</i>                      |         |             |  | MIIH  | NI  | MIIH                                    | MIIH  |          | MIIH     |                |
| bird      | northern harrier           | <i>Circus cyaneus</i>                        | MIIH    | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | olive-sided flycatcher     | <i>Contopus cooperi</i>                      | MIIH    |             | MIIH                                       | MIIH  |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | trumpeter swan             | <i>Cygnus buccinator</i>                     |         |             |  |   | NI  | MIIH                                    |   |          | MIIH     |                |
| bird      | black swift                | <i>Cypseloides niger</i>                     |         |             | MIIH                                       | MIIH  |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | harlequin duck             | <i>Histrionicus histrionicus</i>             | NI      |             |  |   |   |   |   |          | MIIH     |                |
| bird      | white-tailed ptarmigan     | <i>Lagopus leucura</i>                       |         |             | NI   | NI  |   | NI                                      | NI  | NI       |          | NI             |
| bird      | loggerhead shrike          | <i>Lanius ludovicianus</i>                   | MIIH    | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird      | Lewis's woodpecker         | <i>Melanerpes lewis</i>                      | MIIH    | MIIH        | MIIH                                       | MIIH  | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |



|          |                                   |   | Bighorn | Black Hills | Grand Mesa,<br>Uncompahgre and<br>Gunnison | Medicine Bow-<br>Routt and Thunder<br>Basin NG | Nebraska, Samuel<br>R. McKelvie NFs and<br>Oglala, Buffalo Gap<br>and Fort Pierre NGs | Arapahoe-<br>Roosevelt and<br>Pawnee NG | Pike-San Isabel,<br>Cimmaron<br>Comanche NG | San Juan | Shoshone | White<br>River |
|----------|-----------------------------------|---|---------|-------------|--|--|---|---|---|----------|----------|----------------|
| Category | Common name                       | scientific name                                     |         |             |  |  |   |   |   |          |          |                |
| bird     | long-billed curlew                | <i>Numenius<br/>americanus</i>                      |         | NI          |  | MIIH   | NI  | MIIH                                    | MIIH  |          | MIIH     |                |
| bird     | Cassin's sparrow                  | <i>Peucaea cassini</i>                              |         |             |  |  |   | MIIH                                    | MIIH  |          |          |                |
| bird     | black-backed<br>woodpecker        | <i>Picoides arcticus</i>                            |         | MIIH        |  |  |   |   |   |          | MIIH     |                |
| bird     | purple martin                     | <i>Progne subis</i>                                 |         |             | MIIH                                       | MIIH   |   | MIIH                                    | MIIH  | MIIH     |          | MIIH           |
| bird     | flamulated owl                    | <i>Psiloscops<br/>falmmeolus</i>                    | MIIH    | MIIH        | MIIH                                       | MIIH   |   | MIIH                                    | MIIH  | MIIH     |          | MIIH           |
| bird     | McCown's<br>longspur              | <i>Rhynchophanes<br/>mccownii</i>                   |         |             |  | MIIH   | MIIH  | MIIH                                    | MIIH  |          |          |                |
| bird     | Brewer's sparrow                  | <i>Spizella breweri</i>                             | MIIH    |             | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| bird     | greater prairie-<br>chicken       | <i>Tympanuchus<br/>cupido</i>                       |         |             |  |  | MIIH  |   |   |          |          |                |
| bird     | lesser prairie-<br>chicken        | <i>Tympanuchus<br/>pallidicinctus</i>               |         |             |  |  |   |   | MIIH  |          |          |                |
| bird     | Columbian sharp-<br>tailed grouse | <i>Tympanuchus<br/>phasianellus<br/>columbianus</i> |         |             | MIIH                                       | MIIH   |   | MIIH                                    |   | MIIH     |          | MIIH           |
| fish     | bluehead sucker                   | <i>Catostomus<br/>discobolus</i>                    |         |             | NI   | MIIH   |   |   |   | MIIH     |          | MIIH           |
| fish     | flannelmouth<br>sucker            | <i>Catostomus<br/>latipinnis</i>                    |         |             | NI   | MIIH   |   | MIIH                                    |   | MIIH     |          | MIIH           |
| fish     | mountain sucker                   | <i>Catostomus<br/>platyrhynchus</i>                 | NI      | NI          | MIIH                                       | MIIH   |   | MIIH                                    |   |          | MIIH     | MIIH           |
| fish     | northern redbelly<br>dace         | <i>Chrosomus eos</i>                                |         | MIIH        |  |  | MIIH  | MIIH                                    |   |          |          |                |
| fish     | southern redbelly<br>dace         | <i>Chrosomus<br/>erythrogaster</i>                  |         |             |  |  |   |   | MIIH  |          |          |                |
| fish     | finescale dace                    | <i>Chrosomus<br/>neogaeus</i>                       |         | MIIH        |  | MIIH   | MIIH  |   |   |          |          |                |
| fish     | lake chub                         | <i>Couesius plumbeus</i>                            |         | MIIH        |  | MIIH   |   | MIIH                                    |   |          | MIIH     |                |
| fish     | plains topminnow                  | <i>Fundulus sciadicus</i>                           |         |             |  | MIIH   | MIIH  | MIIH                                    |   |          |          |                |
| fish     | roundtail chub                    | <i>Gila robusta</i>                                 |         |             | MIIH                                       | MIIH   |   |   |   | MIIH     |          | MIIH           |
| fish     | plains minnow                     | <i>Hybognathus<br/>placitus</i>                     |         | MIIH        |  | MIIH   | MIIH  |   |   |          |          |                |
| fish     | sturgeon chub                     | <i>Macrhybopsis gelida</i>                          |         | MIIH        |  | MIIH   | MIIH  |   |   |          |          |                |
| fish     | northern pearl<br>dace            | <i>Margariscus<br/>nachtriebi</i>                   |         |             |  |  | MIIH  |   |   |          |          |                |
| fish     | hornyhead chub                    | <i>Nocomis biguttatus</i>                           |         |             |  | MIIH   |   |   |   |          |          |                |

|           |                                   |  | Bighorn | Black Hills | Grand Mesa,<br>Uncompahgre and<br>Gunnison | Medicine Bow-<br>Routt and Thunder<br>Basin NG | Nebraska, Samuel<br>R. McKelvie NFs and<br>Oglala, Buffalo Gap<br>and Fort Pierre NGs | Arapahoe-<br>Roosevelt and<br>Pawnee NG | Pike-San Isabel,<br>Cimmaron<br>Comanche NG | San Juan | Shoshone | White<br>River |
|-----------|-----------------------------------|--|---------|-------------|--|--|---|---|---|----------|----------|----------------|
| Category  | Common name                       | scientific name                            |         |             |  |  |   |   |   |          |          |                |
| fish      | Colorado River<br>cutthroat       | <i>Oncorhynchus clarki<br/>pleuriticus</i> |         |             | MIIH                                       | MIIH   |   | MIIH                                    |   | MIIH     |          | MIIH           |
| fish      | Yellowstone<br>cutthroat          | <i>Oncorhynchus clarkii<br/>bouveri</i>    | MIIH    |             |  | MIIH   |   |   |   |          | MIIH     |                |
| fish      | flathead chub                     | <i>Platygobio gracilis</i>                 |         |             |  | MIIH   | MIIH  |   | MIIH  |          |          |                |
| gastropod | Rocky Mountain<br>capshell        | <i>Acroloxus<br/>coloradensis</i>          |         |             |  | MIIH   |   | MIIH                                    |   |          |          |                |
| gastropod | pygmy<br>mountainsnail            | <i>Oreohelix pygmaea</i>                   | MIIH    |             |  |  |   |   |   |          |          |                |
| gastropod | Cooper's rocky<br>mountainsnail   | <i>Oreohelix strigosa<br/>cooperi</i>      | MIIH    | MIIH        |  |  | MIIH  |   |   |          |          |                |
| insect    | Arogos skipper                    | <i>Atrytone arogos</i>                     | MIIH    | MIIH        |  | MIIH   | MIIH  | MIIH                                    | MIIH  |          |          |                |
| insect    | western<br>bumblebee              | <i>Bombus occidentalis</i>                 | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| insect    | Arapahoe snowfly                  | <i>Capnia arapahoe</i>                     |         |             |  |  |   | MIIH                                    |   |          |          |                |
| insect    | monarch butterfly                 | <i>Danaus plexippus<br/>plexippus</i>      | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| insect    | otloe skipper                     | <i>Hesperia otloe</i>                      |         | MIIH        |  | MIIH   | MIIH  |   | MIIH  |          |          |                |
| insect    | Susan's purse<br>making caddisfly | <i>Ochrotrichia<br/>susanae</i>            |         |             |  |  |   | MIIH                                    |   |          |          |                |
| insect    | Hudsonian<br>emerald              | <i>Somatochlora<br/>hudsonica</i>          |         |             |  | MIIH   |   | MIIH                                    | MIIH  |          | MIIH     |                |
| insect    | regal fritillary                  | <i>Speyeria idalia</i>                     |         | MIIH        |  | MIIH   | MIIH  | MIIH                                    |   |          |          |                |
| insect    | nokomis fritillary                | <i>Speyeria nokomis<br/>nokomis</i>        |         |             | MIIH                                       |  |   |   |   | MIIH     |          | MIIH           |
| mammal    | American<br>hognose skunk         | <i>Conepatus<br/>leuconotus</i>            |         |             |  |  |   | MIIH                                    |   |          |          |                |
| mammal    | Townsend's big<br>eared bat       | <i>Corynorhinus<br/>townsendii</i>         | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal    | white-tailed<br>prairie dog       | <i>Cynomys leucurus</i>                    |         |             | MIIH                                       | MIIH   |   | MIIH                                    |   |          | MIIH     |                |
| mammal    | Gunnison's prairie<br>dog         | <i>Cynomys gunnisoni</i>                   |         |             | MIIH                                       |  |   | MIIH                                    | MIIH  |          |          |                |
| mammal    | black-tailed<br>prairie dog       | <i>Cynomys<br/>ludovicianus</i>            |         | MIIH        |  | MIIH   | MIIH  | MIIH                                    | MIIH  |          |          |                |
| mammal    | spotted bat                       | <i>Euderma<br/>maculatum</i>               | MIIH    |             | MIIH                                       |  |   |   |   | MIIH     | MIIH     | MIIH           |
| mammal    | North American<br>wolverine       | <i>Gulo gulo</i>                           | MIIH    |             | MIIH                                       | MIIH   |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal    | hoary bat                         | <i>Lasiurus cinereus</i>                   | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal    | river otter                       | <i>Lontra canadensis</i>                   |         |             | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |

|          |                                     |  | Bighorn | Black Hills | Grand Mesa,<br>Uncompahgre and<br>Gunnison | Medicine Bow-<br>Routt and Thunder<br>Basin NG | Nebraska, Samuel<br>R. McKelvie NFs and<br>Oglala, Buffalo Gap<br>and Fort Pierre NGs | Arapahoe-<br>Roosevelt and<br>Pawnee NG | Pike-San Isabel,<br>Cimmaron<br>Comanche NG | San Juan | Shoshone | White<br>River |
|----------|-------------------------------------|--|---------|-------------|--|--|---|---|---|----------|----------|----------------|
| Category | Common name                         | scientific name                                    |         |             |  |  |   |   |   |          |          |                |
| mammal   | American marten                     | <i>Martes americana</i>                            | MIIH    | MIIH        | MIIH                                       | MIIH   |   | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal   | water vole                          | <i>Microtus richardsoni</i>                        | NI      |             |  |  |   |   |   |          | NI       |                |
| mammal   | fringed myotis                      | <i>Myotis thysanodes</i>                           | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal   | Rocky Mountain<br>bighorn sheep     | <i>Ovis canadensis<br/>canadensis</i>              | MIIH    | MIIH        | MIIH                                       | MIIH   | MIIH  | MIIH                                    | MIIH  | MIIH     | MIIH     | MIIH           |
| mammal   | desert bighorn<br>sheep             | <i>Ovis canadensis<br/>nelsoni</i>                 |         |             | MIIH                                       |  |   |   |   | MIIH     |          |                |
| mammal   | pygmy shrew                         | <i>Sorex hoyi</i>                                  |         |             | MIIH                                       | MIIH   |   | MIIH                                    |   |          |          | MIIH           |
| mammal   | Wyoming pocket<br>gopher            | <i>Thomomys clusius</i>                            |         |             |  | MIIH   |   |   |   |          |          |                |
| mammal   | kit fox                             | <i>Vulpes macrotis</i>                             |         |             | MIIH                                       |  |   |   |   | MIIH     |          |                |
| mammal   | swift fox                           | <i>Vulpes velox</i>                                |         | MIIH        |  | MIIH   | MIIH  | MIIH                                    | MIIH  |          |          |                |
| reptile  | desert<br>massasauga<br>rattlesnake | <i>Sistrurus tergeminus<br/>edwardsii</i>          |         |             |  |  |   |   | MIIH  |          |          |                |
| reptile  | Black Hills<br>redbelly snake       | <i>Storeria<br/>occipitomaculata<br/>pahasapae</i> |         | NI          |  |  |   |   |   |          |          |                |

VERSION: 6/27/2023

| Category  | Common name                     | scientific name                        | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|-----------|---------------------------------|--|-------------------|----------|----------|------|--------|---------|----------|-------|
| amphibian | SACRAMENTO MOUNTAINS SALAMANDER | <i>Aneides hardii</i>                  |                   |          |          |      |        | MIIH    |          |       |
| amphibian | WESTERN BARKING FROG            | <i>Craugastor augusti cactorum</i>     |                   |          | MIIH     |      |        |         |          | MIIH  |
| amphibian | NORTHERN LEOPARD FROG           | <i>Lithobates pipiens</i>              | MIIH              | MIIH     |          |      | NI     |         |          | MIIH  |
| amphibian | TARAHUMARA FROG                 | <i>Lithobates tarahumarae</i>          |                   |          | MIIH     |      |        |         |          |       |
| amphibian | LOWLAND LEOPARD FROG            | <i>Lithobates yavapaiensis</i>         | MIIH              | MIIH     | MIIH     | MIIH |        |         | MIIH     | MIIH  |
| arachnid  | A Cave Obligate Pseudoscorpion  | <i>Tuberochernes ubicki</i>            |                   |          | NI       |      |        |         |          |       |
| bird      | NORTHERN GOSHAWK                | <i>Accipiter gentilis</i>              | MIIH              | MIIH     | MIIH     | MIIH | MIIH   | MIIH    | MIIH     | MIIH  |
| bird      | VIOLET-CROWNED HUMMINGBIRD      | <i>Amazilia violiceps</i>              |                   |          | MIIH     |      |        |         |          |       |
| bird      | BAIRD'S SPARROW                 | <i>Ammodramus bairdii</i>              | MIIH              |          | MIIH     |      |        | MIIH    |          |       |
| bird      | ARIZONA GRASSHOPPER SPARROW     | <i>Ammodramus savannarum ammolegus</i> |                   |          | MIIH     |      |        |         |          |       |
| bird      | BURROWING OWL (Western)         | <i>Athene cunicularia hypugaea</i>     | MIIH              | MIIH     |          | MIIH | MIIH   | MIIH    |          |       |
| bird      | COMMON BLACK HAWK               | <i>Buteogallus anthracinus</i>         |                   |          |          | MIIH |        |         |          |       |
| bird      | LUCIFER HUMMINGBIRD             | <i>Calothorax lucifer</i>              |                   |          | MIIH     |      |        |         |          |       |
| bird      | COSTA'S HUMMINGBIRD             | <i>Calypte costae</i>                  |                   |          |          | MIIH |        |         |          |       |
| bird      | NORTHERN BEARDLESS-TYRANNULET   | <i>Camptostoma imberbe</i>             |                   |          | MIIH     |      |        |         |          |       |
| bird      | BUFF-COLLARED NIGHTJAR          | <i>Caprimulgus ridgwayi</i>            |                   |          | MIIH     |      |        |         |          |       |

## 20231006\_SensitiveByForestRegionWildlifeOnly

| Category | Common name                  | scientific name                        | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|----------|------------------------------|--|-------------------|----------|----------|------|--------|---------|----------|-------|
| bird     | COMMON GROUND DOVE           | <i>Columbina passerina</i>             |                   |          |          | MIIH |        |         |          |       |
| bird     | BROAD-BILLED HUMMINGBIRD     | <i>Cyananthus latirostris</i>          |                   |          | MIIH     |      |        |         |          |       |
| bird     | GRAY CATBIRD                 | <i>Dumetella carolinensis</i>          | MIIH              |          |          |      |        |         |          |       |
| bird     | BUFF-BREASTED FLYCATCHER     | <i>Empidonax fulvifrons</i>            |                   |          | MIIH     |      |        |         |          |       |
| bird     | EARED QUETZAL                | <i>Euptilotis neoxenus</i>             |                   |          | MIIH     |      |        |         |          |       |
| bird     | AMERICAN PEREGRINE FALCON    | <i>Falco peregrinus anatum</i>         | MIIH              |          | MIIH     | MIIH | MIIH   | MIIH    | MIIH     | MIIH  |
| bird     | CACTUS FERRUGINOUS PYGMY OWL | <i>Glaucidium brasilianum cactorum</i> |                   |          | MIIH     |      |        |         |          |       |
| bird     | BALD EAGLE                   | <i>Haliaeetus leucocephalus</i>        | MIIH              | MIIH     | MIIH     | MIIH | MIIH   | MIIH    | MIIH     | MIIH  |
| bird     | WHITE-EARED HUMMINGBIRD      | <i>Hylocharis leucotis</i>             |                   |          | MIIH     | MIIH |        |         |          |       |
| bird     | YELLOW-EYED JUNCO            | <i>Junco phaeonotus</i>                |                   |          | MIIH     |      |        |         |          | MIIH  |
| bird     | WHISKERED SCREECH OWL        | <i>Megascops trichopsis</i>            |                   |          | MIIH     |      |        |         |          |       |
| bird     | GILA WOODPECKER              | <i>Melanerpes uropygialis</i>          |                   |          |          | MIIH |        |         |          |       |
| bird     | GOULD'S WILD TURKEY          | <i>Meleagris gallopavo mexicana</i>    |                   |          | MIIH     |      |        |         |          |       |
| bird     | ABERT'S TOWHEE               | <i>Melospiza aberti</i>                |                   |          | MIIH     | MIIH |        |         |          |       |
| bird     | SULPHUR-BELLIED FLYCATCHER   | <i>Myiodynastes luteiventris</i>       |                   |          | MIIH     |      |        |         |          | MIIH  |
| bird     | ROSE-THROATED BECARD         | <i>Pachyramphus aglaiae</i>            |                   |          | MIIH     |      |        |         |          |       |
| bird     | VARIED BUNTING               | <i>Passerina versicolor</i>            |                   |          | MIIH     |      |        | MIIH    |          |       |
| bird     | ARIZONA WOODPECKER           | <i>Picoides arizonae</i>               |                   |          | MIIH     |      |        |         |          |       |
| bird     | ELEGANT TROGON               | <i>Trogon elegans</i>                  |                   |          | MIIH     |      |        |         |          |       |

| Category   | Common name                | scientific name                          | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|------------|----------------------------|--|-------------------|----------|----------|------|--------|---------|----------|-------|
| bird       | THICK-BILLED KINGBIRD      | <i>Tyrannus crassirostris</i>            |                   |          | MIIH     |      |        |         |          |       |
| bird       | ARIZONA BELL'S VIREO       | <i>Vireo bellii arizonae</i>             |                   |          |          | MIIH |        | MIIH    |          |       |
| bird       | GRAY VIREO                 | <i>Vireo vicinior</i>                    |                   |          | MIIH     | MIIH |        | MIIH    |          |       |
| bivalve    | CALIFORNIA FLOATER         | <i>Anodonta californiensis</i>           | MIIH              | MIIH     |          |      |        |         |          |       |
| crustacean | KAIBAB FAIRY SHRIMP        | <i>Branchinecta kaibabensis</i>          |                   |          |          |      | MIIH   |         |          |       |
| crustacean | DUMONT'S FAIRY SHRIMP      | <i>Streptocephalus henridumontis</i>     |                   |          |          |      |        | MIIH    |          |       |
| fish       | MEXICAN STONEROLLER        | <i>Campostoma ornatum</i>                |                   |          | MIIH     |      |        |         |          |       |
| fish       | DESERT SUCKER              | <i>Catostomus clarkii</i>                | MIIH              | MIIH     | MIIH     | MIIH |        |         | MIIH     | MIIH  |
| fish       | SONORA SUCKER              | <i>Catostomus insignis</i>               | MIIH              | MIIH     | MIIH     | MIIH |        |         | MIIH     | MIIH  |
| fish       | RIO GRANDE SUCKER          | <i>Catostomus plebeius</i>               |                   |          |          | MIIH |        |         |          |       |
| fish       | LITTLE COLORADO SUCKER     | <i>Catostomus sp.3</i>                   | MIIH              | MIIH     |          |      |        |         |          |       |
| fish       | GREENTHROAT DARTER         | <i>Etheostoma lepidum</i>                |                   |          |          |      |        | MIIH    |          |       |
| fish       | HEADWATER CHUB             | <i>Gila nigra</i>                        |                   | MIIH     |          | MIIH |        |         |          | MIIH  |
| fish       | RIO GRANDE CHUB            | <i>Gila pandora</i>                      |                   |          |          |      |        | MIIH    |          |       |
| fish       | ROUNDTAIL CHUB             | <i>Gila robusta</i>                      | MIIH              | MIIH     |          | MIIH |        |         | MIIH     | MIIH  |
| fish       | HEADWATER CATFISH          | <i>Ictalurus lupus</i>                   |                   |          |          |      |        | MIIH    |          |       |
| fish       | RIO GRANDE CUTTHROAT TROUT | <i>Oncorhynchus clarki virginalis</i>    |                   |          |          | MIIH |        | MIIH    |          |       |
| gastropod  | SILVER CREEK WOODLANDSNAIL | <i>Ashmunella binneyi</i>                |                   |          |          | MIIH |        |         |          |       |
| gastropod  | NO COMMON NAME             | <i>Ashmunella cockerelli argenticola</i> |                   |          |          | MIIH |        |         |          |       |
| gastropod  | BLACK RANGE WOODLANDSNAIL  | <i>Ashmunella cockerelli cockerelli</i>  |                   |          |          | MIIH |        |         |          |       |

## 20231006\_SensitiveByForestRegionWildlifeOnly

| Category  | Common name                    | scientific name                        | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|-----------|--------------------------------|--|-------------------|----------|----------|------|--------|---------|----------|-------|
| gastropod | NO COMMON NAME                 | <i>Ashmunella cockerelli perobtusa</i> |                   |          |          | MIIH |        |         |          |       |
| gastropod | WHITewater CREEK WOODLANDSNAIL | <i>Ashmunella danielsi</i>             |                   |          |          | MIIH |        |         |          |       |
| gastropod | IRON CREEK WOODLANDSNAIL       | <i>Ashmunella mendax</i>               |                   |          |          | MIIH |        |         |          |       |
| gastropod | CAPITAN WOODLANDSNAIL          | <i>Ashmunella pseudodonta</i>          |                   |          |          |      |        | MIIH    |          |       |
| gastropod | NO COMMON NAME                 | <i>Ashmunella tetrodon animorum</i>    |                   |          |          | MIIH |        |         |          |       |
| gastropod | NO COMMON NAME                 | <i>Ashmunella tetrodon inermis</i>     |                   |          |          | MIIH |        |         |          |       |
| gastropod | NO COMMON NAME                 | <i>Ashmunella tetrodon mutator</i>     |                   |          |          | MIIH |        |         |          |       |
| gastropod | DRY CREEK WOODLANDSNAIL        | <i>Ashmunella tetrodon tetrodon</i>    |                   |          |          | MIIH |        |         |          |       |
| gastropod | RIO GRANDE SNAGGLETOOTH        | <i>Gastrocopta riograndensis</i>       |                   |          |          |      |        | MIIH    |          |       |
| gastropod | RUIDOSO SNAGGLETOOTH           | <i>Gastrocopta ruidosensis</i>         |                   |          |          |      |        | MIIH    |          |       |
| gastropod | VAGABOND HOLOSPIRA             | <i>Holospira montivaga</i>             |                   |          |          |      |        | MIIH    |          |       |
| gastropod | NORTHERN THREEBAND (Snail)     | <i>Humboldtiana ultima</i>             |                   |          |          |      |        | MIIH    |          |       |
| gastropod | BEARDED MOUNTAINSNAIL          | <i>Oreohelix barbata</i>               |                   |          | MIIH     | MIIH |        |         |          |       |
| gastropod | PINALENO MOUNTAINSNAIL         | <i>Oreohelix grahamensis</i>           |                   |          | MIIH     |      |        |         |          |       |
| gastropod | NO COMMON NAME                 | <i>Oreohelix metcalfei acutidiscus</i> |                   |          |          | MIIH |        |         |          |       |

20231006\_SensitiveByForestRegionWildlifeOnly

| Category  | Common name                                   | scientific name   | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|-----------|---|---|-------------------|----------|----------|------|--------|---------|----------|-------|
| gastropod | NO COMMON NAME<br>(Black Range mountainsnail) | <i>Oreohelix metcalfei concentrica</i>                              |                   |          |          | MIIH |        |         |          |       |
| gastropod | NO COMMON NAME                                | <i>Oreohelix metcalfei metcalfei</i>                                |                   |          |          | MIIH |        |         |          |       |
| gastropod | NO COMMON NAME                                | <i>Oreohelix metcalfei radiata</i>                                  |                   |          |          | MIIH |        |         |          |       |
| gastropod | NO COMMON NAME                                | <i>Oreohelix nogalensis</i><br>(aka <i>O. strigosa nogalensis</i> ) |                   |          |          |      |        | MIIH    |          |       |
| gastropod | MINERAL CREEK MOUNTAINSNAIL                   | <i>Oreohelix pilsbryi</i>   |                   |          |          | MIIH |        |         |          |       |
| gastropod | MORGAN CREEK MOUNTAINSNAIL                    | <i>Oreohelix swopei</i>   |                   |          |          | MIIH |        |         |          |       |
| gastropod | GILA SPRINGSNAIL                              | <i>Pyrgulopsis gilae</i>  |                   |          |          | MIIH |        |         |          |       |
| gastropod | VERDE RIM SPRINGSNAIL                         | <i>Pyrgulopsis glandulosa</i>                                       |                   |          |          |      |        |         | MIIH     |       |
| gastropod | PAGE SPRINGSNAIL                              | <i>Pyrgulopsis morrisoni</i>  |                   | MIIH     |          |      |        |         |          |       |
| gastropod | FOSSIL SPRINGSNAIL                            | <i>Pyrgulopsis simplex</i>  |                   | MIIH     |          |      |        |         |          | MIIH  |
| gastropod | BROWN SPRINGSNAIL                             | <i>Pyrgulopsis sola</i>   |                   |          |          |      |        |         | MIIH     |       |
| gastropod | NEW MEXICO SPRINGSNAIL                        | <i>Pyrgulopsis thermalis</i>  |                   |          |          | MIIH |        |         |          |       |
| gastropod | HUACHUCA SPRINGSNAIL                          | <i>Pyrgulopsis thompsoni</i>  |                   |          | MIIH     |      |        |         |          |       |
| gastropod | CLARK PEAK TALUSSNAIL                         | <i>Sonorella christenseni</i>                                       |                   |          | MIIH     |      |        |         |          |       |
| gastropod | PINALENO TALUSSNAIL                           | <i>Sonorella grahamensis</i>  |                   |          | MIIH     |      |        |         |          |       |
| gastropod | New Mexico tallussnail                        | <i>Sonorella hachitana peloncillensis</i>                           |                   |          | MIIH     |      |        |         |          |       |
| gastropod | MIMIC TALUSSNAIL                              | <i>Sonorella imitator</i>   |                   |          | MIIH     |      |        |         |          |       |
| gastropod | WET CANYON TALUSSNAIL                         | <i>Sonorella macrophallus</i>                                       |                   |          | MIIH     |      |        |         |          |       |



## 20231006\_SensitiveByForestRegionWildlifeOnly

| Category  | Common name                                | scientific name                      | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|-----------|--|--------------------------------------|-------------------|----------|----------|------|--------|---------|----------|-------|
| gastropod | SONORAN TALUSSNAIL                         | <i>Sonorella magdalenensis</i>       |                   |          | MIIH     |      |        |         |          |       |
| insect    | SUNRISE SKIPPER                            | <i>Adopaeoides prittwitzi</i>        |                   |          | MIIH     |      |        |         |          |       |
| insect    | NETWING MIDGE                              | <i>Agathon arizonicus</i>            |                   |          |          |      |        |         |          | MIIH  |
| insect    | HUACHUCA GIANT SKIPPER                     | <i>Agathymus evansi</i>              |                   |          | MIIH     |      |        |         |          |       |
| insect    | SABINO CANYON DAMSELFLY (aka Dancer)       | <i>Argia sabino</i>                  |                   |          | MIIH     |      |        |         |          |       |
| insect    | CESTUS SKIPPER                             | <i>Atrytonopsis cestus</i>           |                   |          | MIIH     |      |        |         |          |       |
| insect    | A STONEFLY                                 | <i>Capnia caryi</i>                  | MIIH              |          |          | MIIH |        |         |          |       |
| insect    | PARKER'S CYLLOEPUS RIFFLE BEETLE           | <i>Cylloepus parkeri</i>             |                   |          |          |      |        |         |          | MIIH  |
| insect    | CHIRICAHUA WATER SCAVENGER BEETLE          | <i>Cymbiodyta arizonica</i>          |                   |          | MIIH     |      |        |         |          |       |
| insect    | DASHED RINGTAIL                            | <i>Erpetogomphus heterodon</i>       |                   |          |          | MIIH |        |         |          |       |
| insect    | MOTH (Notodontid moth)                     | <i>Euhyparpax rosea</i>              |                   |          |          | MIIH |        |         |          |       |
| insect    | PINALENO MONKEY GRASSHOPPER                | <i>Eumorsea pinaleno</i>             |                   |          | MIIH     |      |        |         |          |       |
| insect    | SACRAMENTO MOUNTAINS CHECKERSPOT BUTTERFLY | <i>Euphydryas anicia cloudcrofti</i> |                   |          |          |      |        | MIIH    |          |       |
| insect    | A MAYFLY                                   | <i>Fallceon eatoni</i>               |                   |          |          |      |        |         |          | MIIH  |
| insect    | "GILA" MAY FLY                             | <i>Lachlania dencyanna</i>           |                   |          |          | MIIH |        |         |          |       |
| insect    | A CADDISFLY                                | <i>Lepidostoma apache</i>            | MIIH              |          |          |      |        |         |          |       |
| insect    | A CADDISFLY                                | <i>Lepidostoma knulli</i>            | MIIH              | MIIH     |          |      |        |         |          |       |
| insect    | A CADDISFLY                                | <i>Limnephilus granti</i>            | MIIH              |          | MIIH     |      |        |         |          |       |
| insect    | FERRIS' COPPER                             | <i>Lycaena ferrisi</i>               | MIIH              |          |          |      |        |         |          |       |

| Category      | Common name  | scientific name                                       | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|---------------|--|---|-------------------|----------|----------|------|--------|---------|----------|-------|
| <b>insect</b> | A MAYFLY   | <i>Moribaetis mimbresaurus</i>                        |                   | MIIH     |          |      |        |         |          |       |
| <b>insect</b> | BALMORHEA SADDLE-CASE CADDISFLY  | <i>Protophila balmorhea</i>                           |                   | MIIH     |          |      |        |         |          |       |
| <b>insect</b> | A CADDISFLY  | <i>Psychoronia brooksi</i>                            |                   |          |          |      |        | MIIH    |          |       |
| <b>insect</b> | BONITA DIVING BEETLE   | <i>Stictotarusus neomexicana (aka. Deroneotes n.)</i> |                   |          |          |      |        | MIIH    |          |       |
| <b>insect</b> | A CADDISFLY  | <i>Wormaldia planae</i>                               |                   | MIIH     |          |      |        |         | MIIH     | MIIH  |
| <b>mammal</b> | NORTHERN PYGMY MOUSE   | <i>Baiomys taylori ater</i>                           |                   |          | MIIH     |      |        |         |          |       |
| <b>mammal</b> | MEXICAN LONG-TONGUED BAT   | <i>Choeronycteris mexicana</i>                        |                   |          | MIIH     |      |        |         |          |       |
| <b>mammal</b> | PALE TOWNSEND'S BIG-EARED BAT  | <i>Corynorhinus townsendii pallescens</i>             | MIIH              | MIIH     | MIIH     | MIIH | MIIH   | MIIH    | MIIH     | MIIH  |
| <b>mammal</b> | GUNNISON'S PRAIRIE DOG (prairie population)                                    | <i>Cynomys gunnisoni</i>                              |                   |          |          | MIIH |        |         |          |       |
| <b>mammal</b> | GUNNISON'S PRAIRIE DOG (montane population)                                    | <i>Cynomys gunnisoni pop. 1</i>                       |                   |          |          | MIIH |        |         |          |       |
| <b>mammal</b> | HOUSEROCK VALLEY CHISEL TOOTHED KANGAROO RAT (aka: Marble Canyon Kangaroo Rat) | <i>Dipodomys microps leucotis</i>                     |                   |          |          |      | MIIH   |         |          |       |
| <b>mammal</b> | SPOTTED BAT  | <i>Euderma maculatum</i>                              | MIIH              | MIIH     |          | MIIH | MIIH   | MIIH    |          | MIIH  |

| Category | Common name   | scientific name  | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|----------|---|--|-------------------|----------|----------|------|--------|---------|----------|-------|
| mammal   | WHITE MOUNTAINS GROUND SQUIRREL                       | <i>Ictidomys tridecemlineatus monticola</i>                        | MIIH              |          |          |      |        |         |          |       |
| mammal   | ALLEN'S LAPPET-BROWED BAT                             | <i>Idionycteris phyllotis</i>                                      | MIIH              | MIIH     | MIIH     | MIIH | MIIH   |         |          | MIIH  |
| mammal   | WESTERN RED BAT                                       | <i>Lasiurus blossevillii</i>                                       | MIIH              | MIIH     | MIIH     | MIIH | MIIH   | MIIH    | MIIH     | MIIH  |
| mammal   | WESTERN YELLOW BAT                                    | <i>Lasiurus xanthinus</i>  |                   |          | MIIH     |      |        |         |          |       |
| mammal   | HOODED SKUNK  | <i>Mephitis macroura milleri</i>                                   |                   |          | MIIH     | MIIH |        |         |          |       |
| mammal   | WHITE-BELLIED LONG-TAILED VOLE                        | <i>Microtus longicaudus leucophaeus</i>                            |                   |          | MIIH     |      |        |         |          |       |
| mammal   | NAVAJO MOGOLLON VOLE                                  | <i>Microtus mogollonensis navaho</i>                               | MIIH              | MIIH     |          |      | MIIH   |         |          |       |
| mammal   | ARIZONA MONTANE VOLE                                  | <i>Microtus montanus arizonensis</i>                               | MIIH              |          |          | MIIH |        |         |          |       |
| mammal   | WHITE MOUNTAINS CHIPMUNK                              | <i>Neotamias minimus arizonensis</i>                               | MIIH              |          |          |      |        |         |          |       |
| mammal   | PEÑASCO LEAST CHIPMUNK                                | <i>Neotamias minimus atristriatus</i>                              |                   |          |          |      |        | MIIH    |          |       |
| mammal   | SPRINGERVILLE SILKY POCKET MOUSE                      | <i>Perognathus flavus goodpasteri</i>                              | MIIH              |          |          |      |        |         |          |       |
| mammal   | MESQUITE (Merriam's) MOUSE                            | <i>Peromyscus merriami</i>   |                   |          | MIIH     |      |        |         |          |       |
| mammal   | ARIZONA GRAY SQUIRREL                                 | <i>Sciurus arizonensis arizonensis</i>                             |                   |          |          | MIIH |        |         |          |       |
| mammal   | CHIRICAHUA FOX SQUIRREL                               | <i>Sciurus nayaritensis chiricahuae</i>                            |                   |          | MIIH     |      |        |         |          |       |
| mammal   | ARIZONA SHREW   | <i>Sorex arizonae</i>  |                   |          | MIIH     |      |        |         |          |       |
| mammal   | WESTERN WATER SHREW (previously American water shrew) | <i>Sorex navigator</i> (previously <i>S. palustris navigator</i> ) | MIIH              |          |          |      |        |         |          |       |

| Category | Common name                                     | scientific name                       | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|----------|---|---------------------------------------|-------------------|----------|----------|------|--------|---------|----------|-------|
| mammal   | NEW MEXICO SHREW                                | <i>Sorex neomexicanus</i>             |                   |          |          |      |        | MIIH    |          |       |
| mammal   | GUADALUPE POCKET GOPHER                         | <i>Thomomys bottae guadalupensis</i>  |                   |          |          |      |        | MIIH    |          |       |
| reptile  | GIANT SPOTTED WHIPTAIL                          | <i>Aspidoscelis stictogramma</i>      |                   |          | MIIH     |      |        |         |          |       |
| reptile  | RED-BACKED WHIPTAIL                             | <i>Aspidoscelis xanthonota</i>        |                   |          | MIIH     |      |        |         |          |       |
| reptile  | MOTTLED ROCK RATTLESNAKE                        | <i>Crotalus lepidus lepidus</i>       |                   |          |          |      |        | MIIH    |          |       |
| reptile  | TWIN-SPOTTED RATTLESNAKE                        | <i>Crotalus pricei</i>                |                   |          | MIIH     |      |        |         |          |       |
| reptile  | ARIZONA RIDGENOSE RATTLESNAKE                   | <i>Crotalus willardi willardi</i>     |                   |          | MIIH     |      |        |         |          |       |
| reptile  | SONORAN DESERT TORTOISE                         | <i>Gopherus morafkai</i>              |                   |          | MIIH     |      |        |         | MIIH     | MIIH  |
| reptile  | THORNSCRUB HOOK-NOSED SNAKE                     | <i>Gyalopion quadrangulare</i>        |                   |          | MIIH     |      |        |         |          |       |
| reptile  | BROWN VINESNAKE                                 | <i>Oxybelis aeneus</i>                |                   |          | MIIH     |      |        |         |          |       |
| reptile  | MOUNTAIN SKINK                                  | <i>Plestiodon callicephalus</i>       |                   |          | MIIH     |      |        |         |          |       |
| reptile  | SLEVIN'S BUNCHGRASS LIZARD                      | <i>Sceloporus slevini</i>             |                   |          | MIIH     |      |        |         |          |       |
| reptile  | GREEN RATSNAKE                                  | <i>Senticolis triaspis</i>            |                   |          | MIIH     |      |        |         |          |       |
| reptile  | CHIHUAHAUN BLACK-HEADED SNAKE                   | <i>Tantilla wilcoxi</i>               |                   |          | MIIH     |      |        |         |          |       |
| reptile  | YAQUI BLACK-HEADED SNAKE                        | <i>Tantilla yaquia</i>                |                   |          | MIIH     |      |        |         |          |       |
| reptile  | ARID LAND RIBBONSNAKE (aka Western ribbonsnake) | <i>Thamnophis proximus diabolicus</i> |                   |          |          |      |        | MIIH    |          |       |
| reptile  | BEZY'S NIGHT LIZARD                             | <i>Xantusia bezyi</i>                 |                   |          | MIIH     |      |        |         |          | MIIH  |

| Category | Common name | <i>scientific name</i> | Apache-Sitgreaves | Coconino | Coronado | Gila | Kaibab | Lincoln | Prescott | Tonto |
|----------|-------------|------------------------|-------------------|----------|----------|------|--------|---------|----------|-------|
|----------|-------------|------------------------|-------------------|----------|----------|------|--------|---------|----------|-------|

VERSION:  
6/27/2023

| Category  | Common name                        | scientific name  | Ashley | Boise | Bridger-Teton | Caribou | Challis | Dixie | Fishlake | Humboldt | Manti-LaSal | Payette | Salmon | Sawtooth | Targhee | Toiyabe | Uinta | Wasatch-Cache |
|-----------|------------------------------------|--|--------|-------|---------------|---------|---------|-------|----------|----------|-------------|---------|--------|----------|---------|---------|-------|---------------|
| amphibian | boreal toad                        | <i>Bufo boreas</i>   | MIIH   |       | MIIH          | MIIH    |         | MIIH  | MIIH     |          | MIIH        |         |        |          | MIIH    |         | MIIH  | MIIH          |
| amphibian | Columbia spotted frog              | <i>Rana leteiventris</i>   | MIIH   | MIIH  | MIIH          | NI      | MIIH    |       |          | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | northern goshawk                   | <i>Accipiter gentilis</i>  | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | boreal owl                         | <i>Aegolius funereus</i>   | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     | MIIH    |         |       | MIIH          |
| bird      | greater sage-grouse                | <i>Centrocercus urophasianus</i>   | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | greater sage grouse (bi-State DPS) | <i>Centrocercus urophasianus</i>   |        |       |               |         |         |       |          |          |             |         |        |          |         | MIIH    |       |               |
| bird      | trumpeter swan                     | <i>Cygnus buccinator</i>   |        |       | NI            | NI      |         |       |          |          |             |         |        |          | NI      |         |       |               |
| bird      | peregrine falcon                   | <i>Falco peregrinus anatum</i>   | NI     | MIIH  | NI            | NI      | NI      | MIIH  | NI       | NI       | NI          | MIIH    | NI     | NI       | NI      | NI      | MIIH  | MIIH          |
| bird      | common loon                        | <i>Gavia immer</i>   |        | MIIH  | MIIH          |         | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     | NI      |         |       |               |
| bird      | bald eagle                         | <i>Haliaeetus leucocephalus</i>  | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | harlequin duck                     | <i>Histrionicus histrionicus</i>   |        |       | MIIH          | NI      | MIIH    |       |          |          |             | MIIH    | MIIH   |          | NI      |         |       |               |
| bird      | mountain quail                     | <i>Oreortyx pictus</i>   |        | MIIH  |               |         |         |       |          | MIIH     |             | MIIH    |        | MIIH     |         | MIIH    |       |               |
| bird      | white-headed woodpecker            | <i>Picoides albolarvatus</i>   |        | MIIH  |               |         |         |       |          |          |             | MIIH    |        | MIIH     |         | MIIH    |       |               |
| bird      | three-toed woodpecker              | <i>Picoides tridactylus</i>  | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | flamulated owl                     | <i>Psiloscops flammeolus</i>   | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | great gray owl                     | <i>Strix nebulosa</i>  | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| bird      | California spotted owl             | <i>Strix occidentalis occidentalis</i>   |        |       |               |         |         |       |          |          |             |         |        |          |         | MIIH    |       |               |
| bird      | Columbian sharp-tailed grouse      | <i>Tympanuchus phasianellus columbianus</i>  |        | MIIH  |               | MIIH    |         |       |          | MIIH     |             | MIIH    |        | MIIH     | MIIH    |         |       | MIIH          |
| fish      | Wood River sculpin                 | <i>Cottus leiopomus</i>  |        |       |               |         |         |       |          |          |             |         |        | MIIH     |         |         |       |               |
| fish      | southern leatherside chub          | <i>Lepidomeda aliciae</i>  |        |       |               |         |         | MIIH  | MIIH     |          | MIIH        |         |        |          |         |         | MIIH  |               |
| fish      | northern leatherside chub          | <i>Lepidomeda copei</i>  |        |       | MIIH          | MIIH    |         |       |          |          |             |         |        | MIIH     | MIIH    |         |       | MIIH          |
| fish      | Yellowstone cutthroat trout        | <i>Oncorhynchus clarki bouvieri</i>  |        |       | MIIH          | NI      |         |       |          |          |             |         |        | MIIH     | MIIH    |         |       |               |
| fish      | westslope cutthroat trout          | <i>Oncorhynchus clarki lewisi</i>  |        | MIIH  | MIIH          |         | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     |         |         |       |               |
| fish      | Colorado River cutthroat trout     | <i>Oncorhynchus clarki pleuriticus</i>   | MIIH   |       | MIIH          |         |         | MIIH  | MIIH     |          | MIIH        |         |        |          |         |         | MIIH  | MIIH          |
| fish      | Bonneville cutthroat trout         | <i>Oncorhynchus clarki utah</i>  |        |       | MIIH          | NI      |         | MIIH  | MIIH     | MIIH     | MIIH        |         |        |          |         |         | MIIH  | MIIH          |
| fish      | Big Lost River whitefish           | <i>Prosopium williamsoni</i>   |        |       |               |         | MIIH    |       |          |          |             |         |        |          |         |         |       |               |
| insect    | Spring Mountain checkerspot        | <i>Chlosyne acastus robusta</i>  |        |       |               |         |         |       |          |          |             |         |        |          |         |         | MIIH  |               |
| insect    | dark blue                          | <i>Euphyllotes ancilla purpura</i>   |        |       |               |         |         |       |          |          |             |         |        |          |         |         | MIIH  |               |
| insect    | Morand's checkerspot               | <i>Euphydryas anicia morandi</i>   |        |       |               |         |         |       |          |          |             |         |        |          |         |         | MIIH  |               |
| mammal    | pygmy rabbit                       | <i>Brachylagus idahoensis</i>  |        |       |               | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     |             |         | MIIH   | MIIH     | MIIH    | MIIH    |       |               |
| mammal    | gray wolf (Rocky Mountain DPS)     | <i>Canis lupus</i>   |        | MIIH  | MIIH          | MIIH    | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     | MIIH    |         |       | MIIH          |
| mammal    | Townsend's western big-eared bat   | <i>Corynorhinus townsendii townsendii</i>  | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| mammal    | spotted bat                        | <i>Euderma maculatum</i>   | MIIH   | MIIH  | MIIH          | MIIH    | MIIH    | MIIH  | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| mammal    | fisher                             | <i>Martes pennanti</i>   |        | MIIH  | MIIH          |         | MIIH    |       |          |          |             | MIIH    | MIIH   | MIIH     | MIIH    |         | MIIH  |               |
| mammal    | bighorn sheep                      | <i>Ovis canadensis</i> , including <i>O.c. canadensis</i> , <i>O.c. californiana</i> , and <i>O.c. melsoni</i> ) | MIIH   | MIIH  | MIIH          |         | MIIH    |       | MIIH     | MIIH     | MIIH        | MIIH    | MIIH   | MIIH     | MIIH    | MIIH    | MIIH  | MIIH          |
| mammal    | southern Idaho ground squirrel     | <i>Spermophilus brunneus endemicus</i>   |        | MIIH  |               |         |         |       |          |          |             | MIIH    |        |          |         |         |       |               |

| category  | Scientific Name                                     | Common Name                              | Angeles | Cleveland | Eldorado | Klamath | Lassen | LBTMU | Los Padres | Mendocino | Modoc | Plumas | San Bernardino | Sequoia National Monument | Shasta-Trinity | Six Rivers | Stanislaus | Tahoe | Comment |
|-----------|---|--|---------|-----------|----------|---------|--------|-------|------------|-----------|-------|--------|----------------|---------------------------|----------------|------------|------------|-------|---------|
| Amphibian | <i>Batrachoseps bramei</i>                          | Fairview slender salamander              |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Amphibian | <i>Batrachoseps gabrieli</i>                        | San Gabriel Mountains slender salamander | MIIH    |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Amphibian | <i>Batrachoseps incognitus</i>                      | San Simeon slender salamander            |         |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| Amphibian | <i>Batrachoseps minor</i>                           | Lesser slender salamander                |         |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| Amphibian | <i>Batrachoseps relictus</i>                        | Relictual slender salamander             |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Amphibian | <i>Batrachoseps simatus</i>                         | Kern Canyon slender salamander           |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Amphibian | <i>Ensatina eschscholtzii croceator</i>             | Yellow-blotched salamander               | MIIH    |           |          |         |        |       | MIIH       |           |       |        |                | MIIH                      |                |            |            |       |         |
| Amphibian | <i>Ensatina eschscholtzii klauberi</i>              | Large-blotched salamander                |         | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Amphibian | <i>Hydromantes brunus</i>                           | Limestone salamander                     |         |           |          |         |        |       |            |           |       |        |                |                           |                |            | MIIH       |       |         |
| Amphibian | <i>Hydromantes shastae</i>                          | Shasta salamander                        |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| Amphibian | <i>Plethodon stormi</i>                             | Siskiyou Mountain salamander             |         |           |          | MIIH    |        |       |            |           |       |        |                |                           |                |            |            |       |         |
| Amphibian | <i>Rana aurora</i>                                  | Northern red-legged frog                 |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           | MIIH       |            |       |         |
| Amphibian | <i>Rana boylei</i>                                  | Foothill yellow-legged frog              |         |           | MIIH     | MIIH    | MIIH   |       | MIIH       | MIIH      |       | MIIH   |                | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Amphibian | <i>Rana cascadae</i>                                | Cascade frog                             |         |           |          | MIIH    | MIIH   |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Amphibian | <i>Rhyacotriton variegatus</i>                      | Southern torrent salamander              |         |           |          | MIIH    |        |       |            |           |       |        |                |                           | MIIH           | MIIH       |            |       |         |
| Bird      | <i>Accipiter gentilis</i>                           | Northern goshawk                         | MIIH    |           | MIIH     | MIIH    | MIIH   | MIIH  | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Bird      | <i>Campylorhynchus brunneicapillus sandiegensis</i> | San Diego cactus wren                    |         | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Bird      | <i>Centrocercus urophasianus</i>                    | Greater sage-grouse                      |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| Bird      | <i>Coturnicops noveboracensis</i>                   | Yellow rail                              |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| Bird      | <i>Empidonax traillii</i>                           | Willow flycatcher                        |         |           | MIIH     | MIIH    | MIIH   | NI    | MIIH       | MIIH      |       | MIIH   | MIIH           | MIIH                      | MIIH           |            | MIIH       | MIIH  |         |
| Bird      | <i>Grus canadensis tabida</i>                       | Greater sandhill crane                   |         |           |          | MIIH    | MIIH   |       |            |           | MIIH  | MIIH   |                |                           |                |            |            |       | NI      |
| Bird      | <i>Haliaeetus leucocephalus</i>                     | Bald eagle                               | MIIH    | MIIH      | MIIH     | MIIH    | MIIH   | MIIH  | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Bird      | <i>Pelecanus occidentalis</i>                       | Brown pelican                            |         | NI        |          |         |        |       | NI         |           |       |        | NI             |                           |                |            |            |       |         |
| Bird      | <i>Strix nebulosa</i>                               | Great gray owl                           |         |           | MIIH     | MIIH    | MIIH   | MIIH  |            |           | MIIH  | MIIH   |                | MIIH                      |                |            |            | MIIH  | MIIH    |
| Bird      | <i>Strix occidentalis occidentalis</i>              | California spotted owl                   | MIIH    | MIIH      | MIIH     |         | MIIH   | MIIH  | MIIH       |           | MIIH  | MIIH   | MIIH           | MIIH                      |                |            |            | MIIH  | MIIH    |
| Bird      | <i>Vireo vicinior</i>                               | Gray vireo                               | MIIH    | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| bivalve   | <i>Anodonta californiensis</i>                      | California floater (freshwater mussel)   |         |           |          |         | MIIH   |       |            |           | MIIH  |        |                |                           | MIIH           | MIIH       |            | MIIH  |         |
| bivalve   | <i>Pisidium ultramontanum</i>                       | Montane peaclam                          |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| Fish      | <i>Catostomus occidentalis lacusanserinus</i>       | Goose Lake sucker                        |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| Fish      | <i>Entosphenus similis</i>                          | Klamath River lamprey                    |         |           |          | MIIH    |        |       |            |           |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Entosphenus tridentatus</i>                      | Pacific lamprey                          |         |           | MIIH     | MIIH    | MIIH   |       | MIIH       | MIIH      | MIIH  |        |                |                           | MIIH           | MIIH       |            |       |         |
| Fish      | <i>Gila bicolor pectinifer</i>                      | Lahontan Lake tui chub                   |         |           |          |         |        | MIIH  |            |           |       |        |                |                           |                |            |            |       | MIIH    |
| Fish      | <i>Gila bicolor thalassina</i>                      | Goose Lake tui chub                      |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| Fish      | <i>Gila orcutti</i>                                 | Arroyo chub                              | MIIH    | MIIH      |          |         |        |       | MIIH       |           |       |        | MIIH           |                           |                |            |            |       |         |

| category  | Scientific Name                              | Common Name                                | Angeles | Cleveland | Eldorado | Klamath | Lassen | LBTMU | Los Padres | Mendocino | Modoc | Plumas | San Bernardino | Sequoia National Monument | Shasta-Trinity | Six Rivers | Stanislaus | Tahoe | Comment |
|-----------|--|--|---------|-----------|----------|---------|--------|-------|------------|-----------|-------|--------|----------------|---------------------------|----------------|------------|------------|-------|---------|
| Fish      | <i>Lampetra hubbsi</i>                       | Kern brook lamprey                         |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Fish      | <i>Lampetra richardsoni</i>                  | Western brook lamprey                      |         |           |          | MIIH    |        |       |            | MIIH      |       |        |                |                           |                | MIIH       |            |       |         |
| Fish      | <i>Lampetra tridentata ssp.</i>              | Goose Lake lamprey                         |         |           |          |         |        |       |            | MIIH      |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Lavinia exilicauda chi</i>                | Clear Lake hitch                           |         |           |          |         |        |       |            | MIIH      |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Mylopharodon conocephalus</i>             | Hardhead                                   |         |           | MIIH     |         | MIIH   |       |            | MIIH      | MIIH  | MIIH   |                | MIIH                      | MIIH           |            | MIIH       | MIIH  |         |
| Fish      | <i>Oncorhynchus clarkii</i>                  | Coastal run cutthroat trout                |         |           |          |         |        |       |            |           |       |        |                |                           |                | MIIH       |            |       |         |
| Fish      | <i>Oncorhynchus mykiss</i>                   | Steelhead - Klamath Mountains Province ESU |         |           |          | MIIH    |        |       |            |           |       |        |                |                           | MIIH           | MIIH       |            |       |         |
| Fish      | <i>Oncorhynchus mykiss aguabonita</i>        | California golden trout                    |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Fish      | <i>Oncorhynchus mykiss aquilarum (pop 5)</i> | Eagle Lake rainbow trout                   |         |           |          |         | MIIH   |       |            |           |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Oncorhynchus mykiss gilberti</i>          | Kern River rainbow trout                   |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Fish      | <i>Oncorhynchus mykiss pop 4</i>             | Warner Valley redband trout                |         |           |          |         |        |       |            | MIIH      |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Oncorhynchus mykiss pop 6</i>             | Goose Lake redband trout                   |         |           |          |         | MIIH   |       |            | MIIH      |       |        |                |                           |                |            |            |       |         |
| Fish      | <i>Oncorhynchus mykiss pop 7</i>             | McCloud River redband trout                |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| Fish      | <i>Oncorhynchus tshawytscha</i>              | Upper Klamath-Trinity chinook ESU          |         |           |          | MIIH    |        |       |            |           |       |        |                |                           | MIIH           | MIIH       |            |       |         |
| Fish      | <i>Oncorhynchus tshawytscha ssp.</i>         | SONCC Chinook salmon                       |         |           |          |         |        |       |            |           |       |        |                |                           |                | MIIH       |            |       |         |
| Fish      | <i>Rhinichthys osculus ssp 8</i>             | Santa Ana speckled dace                    | MIIH    | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| gastropod | <i>Fluminicola seminalis</i>                 | Nugget pebblesnail                         |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Helisoma newberryi newberryi</i>          | Great Basin rams-horn (snail)              |         |           |          |         | MIIH   | MIIH  |            |           |       |        |                |                           |                |            |            |       | MIIH    |
| gastropod | <i>Juga acutifilosa</i>                      | Topaz juga (snail)                         |         |           |          |         | MIIH   |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| gastropod | <i>Juga chacei</i>                           | Chace juga (snail)                         |         |           |          |         |        |       |            |           |       |        |                |                           |                | MIIH       |            |       |         |
| gastropod | <i>Juga nigrina</i>                          | Black juga (snail)                         |         |           |          |         | MIIH   |       |            |           | MIIH  |        |                |                           | MIIH           |            |            |       | MIIH    |
| gastropod | <i>Juga occata</i>                           | Scalloped juga (snail)                     |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Lanx patelloides</i>                      | Kneecap lanx (limpet)                      |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Monadenia troglodytes troglodytes</i>     | Shasta sideband snail                      |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Monadenia troglodytes wintu</i>           | Wintu sideband snail                       |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Pristinicola hemphilli</i>                | Pristine springsnail                       |         |           |          |         |        |       |            |           |       |        |                |                           |                | MIIH       |            |       |         |
| gastropod | <i>Pyrgulopsis lasseni</i>                   | Willow Creek pyrg (springsnail)            |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| gastropod | <i>Rothelix warnerfontis</i>                 | Warner Spring shoulderband snail           |         |           |          |         |        |       |            |           |       |        |                |                           |                |            |            |       |         |
| gastropod | <i>Trilobopsis roperi</i>                    | Shasta chaparral snail                     |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Trilobopsis tehamana</i>                  | Tehama chaparral snail                     |         |           |          | MIIH    |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| gastropod | <i>Vespericola pressleyi</i>                 | Big Bar hesperian snail                    |         |           |          |         |        |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |



| category  | Scientific Name                           | Common Name                          | Angeles | Cleveland | Eldorado | Klamath | Lassen | LBTMU | Los Padres | Mendocino | Modoc | Plumas | San Bernardino | Sequoia National Monument | Shasta-Trinity | Six Rivers | Stanislaus | Tahoe | Comment |
|-----------|---|--------------------------------------|---------|-----------|----------|---------|--------|-------|------------|-----------|-------|--------|----------------|---------------------------|----------------|------------|------------|-------|---------|
| gastropod | <i>Vespericola shasta</i>                 | Shasta hesperian snail               |         |           |          |         | MIIH   |       |            |           |       |        |                |                           | MIIH           |            |            |       |         |
| insect    | <i>Bombus occidentalis</i>                | Western bumble bee                   |         |           | MIIH     | MIIH    | MIIH   | NI    |            |           | MIIH  | MIIH   |                |                           | MIIH           | MIIH       | MIIH       | MIIH  |         |
| insect    | <i>Calliphrys mossii hidakupa</i>         | San Gabriel Mountains elfin          | MIIH    |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Danaus plexippus</i>                   | Monarch butterfly                    |         |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| insect    | <i>Euphilotes battoides vernalis</i>      | Vernal blue butterfly                |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Euphilotes enoptes cryptorufes</i>     | Pratt's blue butterfly               |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Euphilotes enoptes dammersi</i>        | Dammer's blue butterfly              |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Euphydryas editha bingi</i>            | Bing's checkerspot butterfly         |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| insect    | <i>Euphydryas editha ehrlichi</i>         | Ehrlich's checkerspot butterfly      |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Euphydryas editha karinae</i>          | Karin's checkerspot butterfly        |         |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| insect    | <i>Glaucopsyche piasus sagittigera</i>    | Arrowhead blue butterfly             |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Lyceana hermes</i>                     | Hermes copper butterfly              |         | MIIH      |          |         |        |       |            |           |       |        |                |                           |                |            |            |       |         |
| insect    | <i>Plebejus emigdionis</i>                | San Emigdio blue butterfly           | MIIH    |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| insect    | <i>Plebejus saepiolus aureolus</i>        | San Gabriel Mountains blue butterfly | MIIH    |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| insect    | <i>Polites mardon</i>                     | Mardon skipper                       |         |           |          |         |        |       |            |           |       |        |                |                           |                | MIIH       |            |       |         |
| insect    | <i>Speyeria egleis tehachapina</i>        | Tehachapi fritillary butterfly       |         |           |          |         |        |       |            |           |       |        |                | MIIH                      |                |            |            |       |         |
| Mammal    | <i>Antrozous pallidus</i>                 | Pallid bat                           | MIIH    | MIIH      | MIIH     | MIIH    | MIIH   | NI    | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Mammal    | <i>Brachylagus idahoensis</i>             | Pygmy rabbit                         |         |           |          |         |        |       |            |           | MIIH  |        |                |                           |                |            |            |       |         |
| Mammal    | <i>Canis lupus</i>                        | Gray wolf                            |         |           |          | MIIH    | MIIH   |       |            |           | MIIH  | MIIH   |                |                           | MIIH           |            |            |       |         |
| Mammal    | <i>Corynorhinus townsendii</i>            | Townsend's big-eared bat             | MIIH    | MIIH      | MIIH     | MIIH    | MIIH   | MIIH  | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Mammal    | <i>Glaucomys sabrinus californicus</i>    | San Bernardino flying squirrel       |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Mammal    | <i>Gulo gulo luscus</i>                   | North American wolverine             |         |           | MIIH     | MIIH    | MIIH   | MIIH  |            | MIIH      | MIIH  | MIIH   |                | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Mammal    | <i>Martes caurina</i>                     | Pacific marten                       |         |           | MIIH     | MIIH    | MIIH   | MIIH  |            | MIIH      | MIIH  | MIIH   |                | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Mammal    | <i>Myotis thysanodes</i>                  | Fringed myotis                       | MIIH    | MIIH      | MIIH     | MIIH    | MIIH   | MIIH  | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Mammal    | <i>Ovis canadensis nelsoni</i>            | San Gabriel Mountains bighorn sheep  | MIIH    |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Mammal    | <i>Perognathus alticolus alticolus</i>    | White-eared pocket mouse             |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Mammal    | <i>Perognathus alticolus inexpectatus</i> | Tehachapi pocket mouse               | MIIH    |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| Mammal    | <i>Tamias speciosus callipeplus</i>       | Mount Pinos lodgepole chipmunk       |         |           |          |         |        |       | MIIH       |           |       |        |                |                           |                |            |            |       |         |
| Mammal    | <i>Vulpes vulpes necator</i>              | Sierra Nevada red fox                |         |           |          |         | MIIH   |       |            |           |       |        |                |                           |                |            | MIIH       |       |         |
| Reptile   | <i>Actinemys marmorata</i>                | Western pond turtle                  | MIIH    | MIIH      | MIIH     | MIIH    | MIIH   |       | MIIH       | MIIH      | MIIH  | MIIH   | MIIH           | MIIH                      | MIIH           | MIIH       | MIIH       | MIIH  | MIIH    |
| Reptile   | <i>Anniella pulchra</i>                   | California legless lizard            | MIIH    | MIIH      |          |         |        |       | MIIH       |           |       |        | MIIH           | MIIH                      |                |            |            |       |         |

| category | Scientific Name                       | Common Name                       | Angeles | Cleveland | Eldorado | Klamath | Lassen | LTBMU | Los Padres | Mendocino | Modoc | Plumas | San Bernardino | Sequoia National Monument | Shasta-Trinity | Six Rivers | Stanislaus | Tahoe | Comment |
|----------|---------------------------------------|-----------------------------------|---------|-----------|----------|---------|--------|-------|------------|-----------|-------|--------|----------------|---------------------------|----------------|------------|------------|-------|---------|
| Reptile  | <i>Aspidoscelis hyperythra</i>        | Orange-throated whiptail          |         | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Charina umbratica</i>              | Southern rubber boa               |         |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Crotalus ruber ruber</i>           | Red diamond rattlesnake           |         | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Diadophis punctatus modestus</i>   | San Bernardino ringneck snake     | MIIH    |           |          |         |        |       | MIIH       |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Diadophis punctatus similis</i>    | San Diego ringneck snake          |         | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Lampropeltis zonata parvirubra</i> | San Bernardino Mountain kingsnake | MIIH    |           |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Lampropeltis zonata pulchra</i>    | San Diego Mountain kingsnake      |         | MIIH      |          |         |        |       |            |           |       |        |                |                           |                |            |            |       |         |
| Reptile  | <i>Lichanura orcutti</i>              | Coastal rosy boa or 3-lined boa   | MIIH    | MIIH      |          |         |        |       |            |           |       |        | MIIH           |                           |                |            |            |       |         |
| Reptile  | <i>Thamnophis hammondi</i>            | Two-striped garter snake          | MIIH    | MIIH      |          |         |        |       | MIIH       |           |       |        | MIIH           |                           |                |            |            |       |         |

VERSION  
7/6/2023

| Category  | Common name                   | scientific name                   | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|-----------|-------------------------------|-----------------------------------|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| amphibian | Black salamander              | <i>Aneides flavipunctatus</i>     |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| amphibian | Rocky mountain tailed frog    | <i>Ascaphus montanus</i>          |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| amphibian | Cope's giant salamander       | <i>Dicamptodon copei</i>          | NI                   |          |           |                |                 |         | NI                     |          |        |                    |         |                      |         |          |        |                 |            |
| amphibian | Northern leopard frog         | <i>Lithobates pipiens</i>         |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| amphibian | Larch mountain salamander     | <i>Plethodon larselli</i>         | MIIH                 |          |           |                | MIIH            |         | NI                     | MIIH     |        | MIIH               |         |                      |         |          |        |                 |            |
| amphibian | Siskiyou mountains salamander | <i>Plethodon stormi</i>           |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| amphibian | Van dyke's salamander         | <i>Plethodon vandykei</i>         |                      |          |           |                | NI              |         | NI                     |          |        |                    | NI      |                      |         |          |        |                 |            |
| amphibian | Foothill yellow-legged frog   | <i>Rana boylei</i>                |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          | NI     |                 | NI         |
| amphibian | Columbia spotted frog         | <i>Rana luteiventris</i>          |                      |          | MIIH      | MIIH           |                 | MIIH    |                        |          |        |                    |         |                      |         |          | MIIH   |                 | MIIH       |
| amphibian | Cascade torrent salamander    | <i>Rhyacotriton cascadae</i>      | NI                   |          |           |                | MIIH            |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| amphibian | Olympic torrent salamander    | <i>Rhyacotriton olympicus</i>     |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| annelid   | Giant palouse earthworm       | <i>Driloleirus americanus</i>     |                      |          |           |                |                 |         | NI                     |          |        | MIIH               |         |                      |         |          | MIIH   |                 |            |
| bird      | Northern goshawk              | <i>Accipiter gentilis</i>         |                      | MIIH     |           |                |                 |         | NI                     |          |        | MIIH               | NI      |                      |         |          | MIIH   |                 |            |
| bird      | Clark's grebe                 | <i>Aechmophorus clarkii</i>       | NI                   |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird      | Tricolored blackbird          | <i>Agelaius tricolor</i>          |                      |          | MIIH      | MIIH           |                 |         |                        |          | MIIH   |                    |         | MIIH                 |         |          |        |                 |            |
| bird      | Grasshopper sparrow           | <i>Ammodramus savannarum</i>      |                      |          |           |                |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         |          |        |                 |            |
| bird      | Tule goose                    | <i>Anser albifrons elgasi</i>     |                      |          | NI        |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird      | Upland sandpiper              | <i>Bartramia longicauda</i>       |                      |          |           |                | MIIH            | MIIH    |                        |          | MIIH   |                    |         |                      |         | MIIH     |        | MIIH            |            |
| bird      | Bufflehead                    | <i>Bucephala albeola</i>          | MIIH                 |          | MIIH      | MIIH           |                 | MIIH    |                        | MIIH     | MIIH   |                    |         |                      |         |          | MIIH   | MIIH            | MIIH       |
| bird      | Ferruginous hawk              | <i>Buteo regalis</i>              | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird      | Lesser goldfinch              | <i>Carduelis psaltria</i>         | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird      | Greater sage-grouse           | <i>Centrocercus urophasianus</i>  |                      |          | MIIH      | MIIH           |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         |          |        |                 | MIIH       |
| bird      | Yellow rail                   | <i>Coturnicops noveboracensis</i> |                      |          | MIIH      | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 |            |
| bird      | Trumpeter swan                | <i>Cygnus buccinator</i>          |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 | MIIH       |
| bird      | Black swift                   | <i>Cypseloides niger</i>          | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   | MIIH            | MIIH       |
| bird      | Bobolink                      | <i>Dolichonyx oryzivorus</i>      |                      |          |           |                |                 | MIIH    |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird      | Gray flycatcher               | <i>Empidonax wrightii</i>         | MIIH                 |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| bird      | Common loon                   | <i>Gavia immer</i>                | NI                   | MIIH     |           |                | MIIH            |         | NI                     |          |        | MIIH               | NI      |                      |         |          |        |                 |            |
| bird      | Sandhill crane                | <i>Grus canadensis</i>            |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| bird      | Bald eagle                    | <i>Haliaeetus leucocephalus</i>   | MIIH                 | MIIH     | MIIH      | MIIH           | MIIH            | MIIH    | NI                     | MIIH     | MIIH   | MIIH               | NI      | MIIH                 | NI      | MIIH     | MIIH   | MIIH            | MIIH       |
| bird      | Harlequin duck                | <i>Histrionicus histrionicus</i>  | NI                   | MIIH     | MIIH      |                | MIIH            |         | NI                     | NI       |        | MIIH               | NI      | MIIH                 |         |          | MIIH   | MIIH            | MIIH       |
| bird      | Black rosy finch              | <i>Leucosticte atrata</i>         |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        | NI              |            |

| Category | Common name  | scientific name                               | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|----------|--|---|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| bird     | Wallowa rosy finch                                     | <i>Leucosticte tephrocotis wallowa</i>        |                      |          |           |                |                 | NI      |                        |          |        |                    |         |                      |         |          |        | NI              |            |
| bird     | Acorn woodpecker                                       | <i>Melanerpes formicivorus</i>                | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird     | Lewis's woodpecker                                     | <i>Melanerpes lewis</i>                       | MIIH                 | MIIH     | MIIH      | MIIH           |                 | MIIH    |                        | MIIH     | MIIH   | MIIH               |         | MIIH                 |         | MIIH     | MIIH   | MIIH            | MIIH       |
| bird     | Ash-throated flycatcher                                | <i>Myiarchus cinerascens</i>                  | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| bird     | Long-billed curlew                                     | <i>Numenius americanus</i>                    | NI                   |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| bird     | Mountain quail   | <i>Oreortyx pictus</i>                        | MIIH                 |          |           |                | MIIH            |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| bird     | Northern waterthrush                                   | <i>Parkesia noveboracensis</i>                |                      |          | MIIH      |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 | MIIH       |
| bird     | American white pelican                                 | <i>Pelecanus erythrorhynchos</i>              |                      |          |           | MIIH           |                 |         |                        |          | MIIH   | MIIH               |         | MIIH                 |         |          |        |                 |            |
| bird     | California brown pelican                               | <i>Pelecanus occidentalis californicus</i>    |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          |        |                 |            |
| bird     | White-headed woodpecker                                | <i>Picoides albolarvatus</i>                  | MIIH                 | MIIH     | MIIH      | MIIH           |                 | MIIH    |                        | MIIH     | MIIH   | MIIH               |         | MIIH                 |         | MIIH     | MIIH   | MIIH            | MIIH       |
| bird     | Green-tailed towhee                                    | <i>Pipilo chlorurus</i>                       | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| bird     | Horned grebe   | <i>Podiceps auritus</i>                       | NI                   |          | MIIH      |                |                 |         |                        |          | MIIH   |                    |         |                      |         |          | MIIH   |                 |            |
| bird     | Red-necked grebe                                       | <i>Podiceps grisegena</i>                     |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 |            |
| bird     | Purple martin  | <i>Progne subis</i>                           | MIIH                 |          |           | MIIH           |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          | MIIH   |                 | MIIH       |
| bird     | Great gray owl   | <i>Strix nebulosa</i>                         |                      | MIIH     |           |                | MIIH            |         | NI                     |          |        | MIIH               |         |                      |         | MIIH     |        |                 |            |
| bird     | Sharp-tailed grouse                                    | <i>Tympanuchus phasianellus</i>               |                      |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| bird     | Columbian sharp-tailed grouse                          | <i>Tympanuchus phasianellus columbianus</i>   |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        | MIIH            |            |
| bivalve  | Western ridged mussel                                  | <i>Gonidea angulata</i>                       | MIIH                 |          |           | MIIH           | MIIH            | MIIH    |                        |          | MIIH   |                    |         | MIIH                 | NI      | MIIH     | MIIH   | MIIH            |            |
| bivalve  | Montane peaclam  | <i>Pisidium ultramontanum</i>                 |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Modoc sucker   | <i>Catostomus microps</i>                     |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Goose lake sucker                                      | <i>Catostomus occidentalis lacusanserinus</i> |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Margined sculpin                                       | <i>Cottus marginatus</i>                      |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| fish     | Pit sculpin  | <i>Cottus pitensis</i>                        |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Lake Chub  | <i>Coesius plumbeus</i>                       |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| fish     | Miller Lake lamprey                                    | <i>Entosphenus minimus</i>                    |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Pacific lamprey  | <i>Entosphenus tridentatus</i>                | MIIH                 |          |           | MIIH           | MIIH            | MIIH    |                        | MIIH     |        | MIIH               |         | MIIH                 | NI      | MIIH     | MIIH   | MIIH            | MIIH       |
| fish     | Pit roach  | <i>Lavinia symmetricus mitrulus</i>           |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish     | Olympic mudminnow                                      | <i>Novumbra hubbsi</i>                        |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| fish     | Coastal cutthroat trout (SW Washington/Columbia River) | <i>Oncorhynchus clarkii clarkii</i>           | MIIH                 |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |

| Category  | Common name                            | scientific name                       | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|-----------|--|---------------------------------------|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| fish      | Westslope cutthroat trout              | <i>Oncorhynchus clarkii lewisi</i>    |                      | MIIH     |           |                |                 | MIIH    |                        |          |        | MIIH               |         |                      |         | MIIH     |        | MIIH            |            |
| fish      | Chum salmon (Pacific Coast)            | <i>Oncorhynchus keta</i>              |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          |        |                 |            |
| fish      | Oregon Great Basin redband trout       | <i>Oncorhynchus mykiss newberrii</i>  |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish      | Steelhead (Klamath Mountains Province) | <i>Oncorhynchus mykiss</i>            |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| fish      | Steelhead (Oregon Coast)               | <i>Oncorhynchus mykiss</i>            |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          | MIIH   |                 |            |
| fish      | Inland Columbia Basin redband trout    | <i>Oncorhynchus mykiss gairdneri</i>  | MIIH                 | MIIH     | MIIH      |                |                 | MIIH    |                        | MIIH     | MIIH   | MIIH               |         |                      |         | MIIH     |        | MIIH            |            |
| fish      | Chinook salmon (SONCC)                 | <i>Oncorhynchus tshawytscha</i>       |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| fish      | Oregon chub                            | <i>Oregonichthys crameri</i>          |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 | MIIH       |
| fish      | Umpqua chub                            | <i>Oregonichthys kalawatseti</i>      |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          | MIIH   |                 |            |
| fish      | Pygmy whitefish                        | <i>Prosopium coulterii</i>            |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| fish      | Umatilla dace                          | <i>Rhinichthys umatilla</i>           |                      | MIIH     |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish      | Oregon lakes tui chub                  | <i>Siphateles bicolor oregonensis</i> |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| fish      | Goose lake tui chub                    | <i>Siphateles bicolor thalassina</i>  |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Cascades axetail slug                  | <i>Carinacauda stormi</i>             |                      |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          | MIIH   |                 | MIIH       |
| gastropod | Harney Basin duskysnail                | <i>Colligyrus depressus</i>           |                      |          |           | MIIH           |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         |          |        |                 |            |
| gastropod | Rocky Mountain duskysnail              | <i>Colligyrus greggi</i>              | MIIH                 |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Puget oregonian                        | <i>Cryptomastix devia</i>             | MIIH                 |          |           |                | MIIH            |         | NI                     | MIIH     |        | MIIH               | NI      |                      |         |          |        |                 |            |
| gastropod | Columbia Gorge oregonian               | <i>Cryptomastix hendersoni</i>        | NI                   |          |           |                | MIIH            |         |                        | NI       |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Poplar oregonian                       | <i>Cryptomastix populi</i>            |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Shortface lanx                         | <i>Fisherola nuttalli</i>             | MIIH                 |          |           |                |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Columbia pebblesnail                   | <i>Fluminicola fuscus</i>             | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        | MIIH            |            |
| gastropod | Modoc pebblesnail                      | <i>Fluminicola modoci</i>             |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Turban pebblesnail                     | <i>Fluminicola turbiniformis</i>      |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Olympia pebblesnail                    | <i>Fluminicola virens</i>             | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         | NI                   | NI      |          |        |                 | MIIH       |
| gastropod | Salmon coil                            | <i>Helicodiscus salmonaceus</i>       |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Great basin ramshorn                   | <i>Helisoma newberryi</i>             |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Oregon shoulderband                    | <i>Helminthoglypta hertleini</i>      |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          | MIIH   |                 |            |
| gastropod | Keeled jumping-slug                    | <i>Hemphillia burringtoni</i>         |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| gastropod | Malone jumping-slug                    | <i>Hemphillia malonei</i>             | NI                   |          |           |                | NI              |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| gastropod | Topaz juga                             | <i>Juga acutiflora</i>                |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |

| Category  | Common name                 | scientific name                             | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|-----------|-----------------------------|---|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| gastropod | Highcap lanx                | <i>Lanx alta</i>                            |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          | MIIH   |                 |            |
| gastropod | Newcomb's littorine snail   | <i>Littorina subrotundata</i>               |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          |        |                 |            |
| gastropod | Magnum mantleslug           | <i>Magnipelta mycophaga</i>                 |                      | NI       |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Umatilla megomphix          | <i>Megomphix lutarius</i>                   |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Green sideband              | <i>Monadenia fidelis flava</i>              |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| gastropod | Dalles sideband             | <i>Monadenia fidelis minor</i>              | NI                   |          |           |                | NI              |         | NI                     |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Grand coulee mountainsnail  | <i>Oreohelix junii</i>                      |                      |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| gastropod | Blue mountainsnail          | <i>Oreohelix strigosa delicata</i>          |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Dalles mountainsnail        | <i>Oreohelix variabilis</i>                 | MIIH                 |          | MIIH      |                |                 |         |                        |          | MIIH   |                    |         |                      |         |          |        |                 |            |
| gastropod | Humped coin                 | <i>Polygyrella polygyrella</i>              |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 |            |
| gastropod | Robust walker               | <i>Pomatiopsis binneyi</i>                  |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| gastropod | Pacific walker              | <i>Pomatiopsis californica</i>              |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          |        |                 |            |
| gastropod | Crater Lake tightcoil       | <i>Pristiloma crateris</i>                  |                      |          | MIIH      | MIIH           |                 |         |                        | MIIH     |        |                    |         | MIIH                 |         | MIIH     | MIIH   |                 | MIIH       |
| gastropod | Thinlip tightcoil           | <i>Pristiloma idahoense</i>                 |                      | NI       |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Broadwhorl tightcoil        | <i>Pristiloma johnsoni</i>                  |                      |          |           |                | MIIH            |         | NI                     |          |        |                    | NI      |                      |         |          |        |                 |            |
| gastropod | Crowned tightcoil           | <i>Pristiloma pilsbryi</i>                  | MIIH                 |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Shiny tightcoil             | <i>Pristiloma wascoense</i>                 | MIIH                 |          | MIIH      |                | MIIH            | MIIH    | NI                     | MIIH     |        | MIIH               |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | Pristine springsnail        | <i>Pristinicola hemphilli</i>               | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| gastropod | Blue-gray tail-dropper      | <i>Prophysaon coeruleum</i>                 | NI                   |          |           |                | NI              |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| gastropod | Archimedes springsnail      | <i>Pyrgulopsis archimedis</i>               |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Jackson Lake springsnail    | <i>Pyrgulopsis robusta</i>                  | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Fir pinwheel                | <i>Radiodiscus abietum</i>                  |                      | MIIH     |           |                |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         | MIIH     |        | MIIH            |            |
| gastropod | A freshwater snail          | <i>Taylorconcha insperata</i>               |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 | MIIH       |
| gastropod | Pacific vertigo             | <i>Vertigo andrusiana</i>                   |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Dalles hesperian            | <i>Vespericola depressus</i>                | MIIH                 |          | MIIH      |                | MIIH            |         |                        | MIIH     |        |                    |         | MIIH                 |         |          |        |                 |            |
| gastropod | Siskiyou hesperian          | <i>Vespericola sierranus</i>                |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         | MIIH                 |         |          | MIIH   |                 |            |
| gastropod | Lined ramshorn              | <i>Vorticifex effusus diagonalis</i>        |                      |          |           |                | MIIH            |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| gastropod | Klamath ramshorn            | <i>Vorticifex klamathensis klamathensis</i> |                      |          |           |                | MIIH            |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect    | Zigzag darner               | <i>Aeshna sitchensis</i>                    |                      | MIIH     | MIIH      |                | MIIH            |         |                        | MIIH     |        | MIIH               |         |                      |         |          |        |                 | MIIH       |
| insect    | Subarctic darner            | <i>Aeshna subarctica</i>                    |                      | MIIH     |           |                | MIIH            |         |                        | MIIH     |        | MIIH               |         |                      |         |          |        |                 |            |
| insect    | Beller's ground beetle      | <i>Agonum belleri</i>                       |                      |          |           |                | MIIH            |         | NI                     | MIIH     |        |                    | NI      |                      |         |          |        |                 |            |
| insect    | Scott's apatanian caddisfly | <i>Allomyia scotti</i>                      |                      |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |
| insect    | Astarte fritillary          | <i>Boloria astarte</i>                      |                      |          |           |                |                 |         |                        |          |        | NI                 |         |                      |         |          |        |                 |            |
| insect    | Meadow fritillary           | <i>Boloria bellona</i>                      |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         | MIIH     |        |                 |            |
| insect    | Freija fritillary           | <i>Boloria freija</i>                       |                      |          |           |                |                 |         |                        |          |        | NI                 |         |                      |         |          |        |                 |            |
| insect    | Silver-bordered fritillary  | <i>Boloria selene</i>                       |                      |          | MIIH      |                |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         |          |        | MIIH            |            |

| Category | Common name                        | scientific name                            | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|----------|------------------------------------|--|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| insect   | Franklin's bumble bee              | <i>Bombus franklini</i>                    |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| insect   | Morrisoni bumble bee               | <i>Bombus morrisoni</i>                    |                      |          | MIIH      | MIIH           |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         | MIIH     |        | MIIH            | MIIH       |
| insect   | Western bumble bee                 | <i>Bombus occidentalis</i>                 |                      | MIIH     | MIIH      | MIIH           | MIIH            | MIIH    | NI                     | MIIH     | MIIH   | MIIH               | NI      | MIIH                 | NI      | MIIH     | MIIH   | MIIH            | MIIH       |
| insect   | Suckley cuckoo bumble bee          | <i>Bombus suckleyi</i>                     |                      | MIIH     | MIIH      | MIIH           | MIIH            |         | NI                     | MIIH     |        | MIIH               | NI      | MIIH                 |         | MIIH     | MIIH   | MIIH            | MIIH       |
| insect   | Barry's hairstreak                 | <i>Callophrys gryneus chalcosiva</i>       |                      |          |           |                | MIIH            |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| insect   | Rosner's hairstreak                | <i>Callophrys gryneus rosneri</i>          |                      | MIIH     |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Johnson's hairstreak               | <i>Callophrys johnsoni</i>                 | MIIH                 |          |           |                | MIIH            |         | NI                     |          |        |                    | NI      |                      |         | MIIH     |        |                 |            |
| insect   | Siskiyou short-horned grasshopper  | <i>Chloealtis aspasma</i>                  |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         | MIIH                 |         |          | MIIH   |                 |            |
| insect   | Siuslaw sand tiger beetle          | <i>Cicindela hirticollis siuslawensis</i>  |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          |        |                 |            |
| insect   | Subarctic bluet                    | <i>Coenagrion interrogatum</i>             |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| insect   | Sullivan's sulphur                 | <i>Colias christina sullivanii</i>         |                      |          |           |                |                 | MIIH    |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Labrador sulphur                   | <i>Colias nastes</i>                       |                      |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| insect   | Intermountain sulphur              | <i>Colias occidentalis pseudochristina</i> |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| insect   | Eastern tailed blue                | <i>Cupido comyntas</i>                     |                      | MIIH     |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Gillette's checkerspot             | <i>Euphydryas gillettii</i>                |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        | MIIH            |            |
| insect   | A caddisfly                        | <i>Farula constricta</i>                   | MIIH                 |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |
| insect   | Columbia clubtail                  | <i>Gomphus lynnae</i>                      |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         | MIIH     |        |                 |            |
| insect   | Golden hairstreak                  | <i>Habrodais grunus</i>                    | MIIH                 |          |           |                | MIIH            |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| insect   | Oregon branded skipper             | <i>Hesperia colorado oregonia</i>          |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          |        |                 |            |
| insect   | Lustrous copper                    | <i>Lycaena cupreus</i>                     |                      |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         | MIIH     |        |                 |            |
| insect   | Makah copper                       | <i>Lycaena mariposa charlottensis</i>      |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| insect   | Wahkeena Falls flightless stonefly | <i>Nanonemoura wahkeena</i>                | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Columbia Gorge caddisfly           | <i>Neothremma andersoni</i>                | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | A caddisfly                        | <i>Neothremma prolata</i>                  | MIIH                 |          |           |                |                 |         |                        | MIIH     |        |                    |         |                      |         |          |        |                 |            |
| insect   | Yuma skipper                       | <i>Ochlodes yuma</i>                       | NI                   |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        | MIIH            |            |
| insect   | Olympic arctic                     | <i>Oeneis chryxus valerata</i>             |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| insect   | Melissa arctic                     | <i>Oeneis melissa</i>                      |                      |          |           |                |                 |         | NI                     |          |        | MIIH               |         |                      |         |          |        |                 |            |
| insect   | Leona's little blue butterfly      | <i>Philotiella leona</i>                   |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Puget blue                         | <i>Plebejus icarioides blackmorei</i>      |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| insect   | Lupine blue butterfly              | <i>Plebejus lupini spangelatus</i>         |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| insect   | Gray-blue butterfly                | <i>Plebejus podarce klamathensis</i>       |                      |          |           | MIIH           |                 |         |                        |          |        |                    |         | MIIH                 |         |          | MIIH   |                 | MIIH       |
| insect   | Coastal greenish blue butterfly    | <i>Plebejus saepiolus littoralis</i>       |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          |        |                 |            |
| insect   | Mardon skipper                     | <i>Polites mardon</i>                      | MIIH                 |          |           | MIIH           | MIIH            |         |                        | MIIH     |        |                    |         | MIIH                 |         |          | MIIH   |                 | MIIH       |
| insect   | Peck's skipper                     | <i>Polites peckius</i>                     |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |

| Category | Common name                      | scientific name                  | Columbia River Gorge | Colville | Deschutes | Fremont-Winema | Gifford Pinchot | Malheur | Mt. Baker - Snoqualmie | Mt. Hood | Ochoco | Okanagon-Wenatchee | Olympic | Rogue River-Siskiyou | Siuslaw | Umatilla | Umpqua | Wallowa-Whitman | Willamette |
|----------|----------------------------------|----------------------------------|----------------------|----------|-----------|----------------|-----------------|---------|------------------------|----------|--------|--------------------|---------|----------------------|---------|----------|--------|-----------------|------------|
| insect   | Tawny-edged skipper              | <i>Polites themistocles</i>      |                      | MIIH     |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| insect   | A caddisfly                      | <i>Rhyacophila chandleri</i>     |                      |          | MIIH      |                |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 | MIIH       |
| insect   | Haddock's rhyacophilan caddisfly | <i>Rhyacophila haddocki</i>      |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 | NI      |          |        |                 |            |
| insect   | A caddisfly                      | <i>Rhyacophila leechi</i>        |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 | MIIH       |
| insect   | Delicate emerald                 | <i>Somatochlora franklini</i>    |                      |          | MIIH      |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Whitehouse emerald               | <i>Somatochlora whitehousei</i>  |                      |          | MIIH      |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| insect   | Coronis fritillary               | <i>Speyeria coronis coronis</i>  |                      |          |           |                |                 |         |                        |          |        |                    |         | MIIH                 |         |          | MIIH   |                 |            |
| insect   | Great basin fritillary           | <i>Speyeria egleis</i>           | MIIH                 |          |           |                | MIIH            |         |                        |          |        | MIIH               |         |                      |         |          | MIIH   |                 |            |
| insect   | Valley silverspot                | <i>Speyeria zerene bremnerii</i> |                      |          |           |                |                 |         | NI                     |          |        |                    | NI      |                      |         |          |        |                 |            |
| mammal   | Pallid bat                       | <i>Antrozous pallidus</i>        | MIIH                 |          | MIIH      | MIIH           |                 | MIIH    |                        |          |        |                    |         | MIIH                 | NI      |          | MIIH   |                 | MIIH       |
| mammal   | Oregon red tree vole             | <i>Arborimus longicaudus</i>     |                      |          |           |                |                 |         |                        |          |        |                    |         |                      | NI      |          |        |                 |            |
| mammal   | Pygmy rabbit                     | <i>Brachylagus idahoensis</i>    |                      |          |           | MIIH           |                 | MIIH    |                        |          | MIIH   |                    |         |                      |         |          |        |                 |            |
| mammal   | Gray wolf                        | <i>Canis lupus</i>               |                      | MIIH     | MIIH      | MIIH           | MIIH            | MIIH    | NI                     | MIIH     |        | MIIH               |         | MIIH                 |         |          | MIIH   |                 | MIIH       |
| mammal   | Townsend's big-eared bat         | <i>Corynorhinus townsendii</i>   | MIIH                 |          | MIIH      | MIIH           |                 | MIIH    |                        | MIIH     | MIIH   |                    |         | NI                   |         |          | MIIH   | MIIH            | MIIH       |
| mammal   | Spotted bat                      | <i>Euderma maculatum</i>         |                      |          | MIIH      |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 | MIIH       |
| mammal   | North American Wolverine         | <i>Gulo gulo luscus</i>          | MIIH                 | MIIH     | MIIH      | MIIH           | MIIH            | MIIH    | MIIH                   | MIIH     | MIIH   | MIIH               |         | MIIH                 | MIIH    | MIIH     | MIIH   | MIIH            | MIIH       |
| mammal   | Olympic marmot                   | <i>Marmota olympus</i>           |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| mammal   | Pacific marten                   | <i>Martes caurina</i>            |                      |          |           |                |                 |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| mammal   | Keen's myotis                    | <i>Myotis keenii</i>             |                      |          |           |                | NI              |         |                        |          |        |                    | NI      |                      |         |          |        |                 |            |
| mammal   | Little Brown myotis              | <i>Myotis lucifugus</i>          | MIIH                 | MIIH     |           |                | MIIH            |         | NI                     |          |        | MIIH               | NI      |                      |         |          | MIIH   |                 |            |
| mammal   | Fringed myotis                   | <i>Myotis thysanodes</i>         | MIIH                 |          | MIIH      | MIIH           |                 | MIIH    |                        | MIIH     |        |                    |         | MIIH                 | NI      | MIIH     | MIIH   | MIIH            | MIIH       |
| mammal   | Red-tailed chipmunk              | <i>Neotamias ruficaudus</i>      |                      | MIIH     |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| mammal   | Mountain goat                    | <i>Oreamnos americanus</i>       |                      |          |           |                | MIIH            |         | NI                     |          |        | MIIH               |         |                      |         |          | MIIH   |                 |            |
| mammal   | Bighorn sheep                    | <i>Ovis canadensis</i>           |                      |          | MIIH      |                |                 | MIIH    | NI                     |          |        | MIIH               |         |                      |         |          |        |                 |            |
| mammal   | Western gray squirrel            | <i>Sciurus griseus</i>           | MIIH                 |          |           |                |                 |         |                        |          |        | MIIH               |         |                      |         |          |        |                 |            |
| mammal   | Pygmy shrew                      | <i>Sorex hoyi</i>                |                      | MIIH     |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| mammal   | Preble's shrew                   | <i>Sorex preblei</i>             |                      |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          | MIIH   |                 |            |
| mammal   | Cascade red fox                  | <i>Vulpes vulpes cascadenis</i>  |                      |          |           |                | MIIH            |         | NI                     |          |        | MIIH               |         |                      |         |          |        |                 |            |
| mammal   | Sierra nevada red fox            | <i>Vulpes vulpes necator</i>     |                      |          | MIIH      | MIIH           |                 |         |                        | MIIH     |        |                    |         | MIIH                 |         |          | MIIH   |                 | MIIH       |
| reptile  | Western pond turtle              | <i>Actinemys marmorata</i>       | MIIH                 |          |           | MIIH           |                 |         |                        | MIIH     |        | MIIH               |         | MIIH                 | MIIH    |          | MIIH   |                 | MIIH       |
| reptile  | Painted turtle                   | <i>Chrysemys picta</i>           | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |
| reptile  | California mountain kingsnake    | <i>Lampropeltis zonata</i>       | MIIH                 |          |           |                |                 |         |                        |          |        |                    |         |                      |         |          |        |                 |            |



| category  | Common name                    | Scientific name                     | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|-----------|--------------------------------|-------------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| amphibian | green salamander               | <i>Aneides aeneus</i>               | NI             | NI           | MIIH                 |          |                |           |                    | NI                              |          |       | MIIH                  | NI     |               |                        |                |
| amphibian | hellbender salamander          | <i>Cryptobranchus alleganiensis</i> |                | NI           | NI                   | NI       |                |           |                    | NI                              |          |       | NI                    |        |               |                        |                |
| amphibian | Apalachicola dusky salamander  | <i>Desmognathus apalachicola</i>    |                |              |                      |          | NI             |           |                    |                                 |          |       |                       |        |               |                        |                |
| amphibian | dwarf black-bellied salamander | <i>Desmognathus folkertsi</i>       |                |              | NI                   |          |                |           |                    |                                 |          |       | NI                    |        |               |                        |                |
| amphibian | northern pygmy salamander      | <i>Desmognathus organi</i>          |                |              |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| amphibian | crawfish frog                  | <i>Lithobates areolatus</i>         |                |              |                      |          |                |           |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| amphibian | gopher frog                    | <i>Lithobates capito</i>            | NI             |              |                      |          | MIIH           |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| amphibian | striped newt                   | <i>Notophthalmus perstriatus</i>    |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| amphibian | Caddo Mountain salamander      | <i>Plethodon caddoensis</i>         |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| amphibian | Chattahoochee slimy salamander | <i>Plethodon chattahoochee</i>      |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| amphibian | Cheoah Bald salamander         | <i>Plethodon cheoah</i>             |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| amphibian | Fourche Mountain salamander    | <i>Plethodon fourchensis</i>        |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| amphibian | Peaks of Otter salamander      | <i>Plethodon hubrichti</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| amphibian | Kiamichi slimy salamander      | <i>Plethodon kiamichi</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| amphibian | Louisiana slimy salamander     | <i>Plethodon kisatchie</i>          |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        |               |                        |                |
| amphibian | Rich Mountain salamander       | <i>Plethodon ouachitae</i>          |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| amphibian | Cow Knob salamander            | <i>Plethodon punctatus</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| amphibian | Sequoia slimy salamander       | <i>Plethodon sequoyah</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| amphibian | Big Levels salamander          | <i>Plethodon sherando</i>           |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| amphibian | Shenandoah Mountain salamander | <i>Plethodon virginia</i>           |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| amphibian | Webster's salamander           | <i>Plethodon websteri</i>           |                |              | MIIH                 |          |                |           | NI                 |                                 |          |       |                       | NI     |               |                        |                |
| amphibian | Weller's salamander            | <i>Plethodon welleri</i>            |                |              |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| amphibian | patch-nosed salamander         | <i>Urspelerpes brucei</i>           |                |              | NI                   |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bird      | Henslow's sparrow              | <i>Ammodramus henslowii</i>         | NI             |              |                      |          |                | NI        |                    | NI                              | NI       | NI    |                       |        | NI            | NI                     |                |
| bird      | Florida sandhill crane         | <i>Grus canadensis pratensis</i>    |                |              |                      |          | NI             |           |                    |                                 |          |       |                       |        |               |                        |                |
| bird      | Bachman's sparrow              | <i>Peucaea aestivalis</i>           | NI             |              | MIIH                 |          | MIIH           | NI        | NI                 |                                 | NI       | NI    | MIIH                  | NI     | MIIH          |                        |                |
| bivalve   | elktoe                         | <i>Alasmidonta marginata</i>        |                | NI           |                      |          |                |           |                    | NI                              | NI       |       |                       |        |               |                        |                |
| bivalve   | triangle floater               | <i>Alasmidonta undulata</i>         |                |              |                      |          |                |           |                    |                                 |          |       | NI                    |        |               |                        |                |
| bivalve   | brook floater                  | <i>Alasmidonta varicosa</i>         |                |              | MIIH                 |          |                |           |                    | NI                              |          |       | NI                    | NI     |               |                        |                |
| bivalve   | slippershell                   | <i>Alasmidonta viridis</i>          |                |              |                      |          |                |           |                    | NI                              |          | NI    | MIIH                  |        |               |                        |                |

| category   | Common name              | Scientific name                        | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|------------|--------------------------|--|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| bivalve    | Apalachicola floater     | <i>Anodonta heardi</i>                 |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | rayed creekshell         | <i>Anodontoides radiatus</i>           | NI             |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| bivalve    | western fanshell         | <i>Cyprogenia aberti</i>               |                |              |                      |          |                |           |                    |                                 | NI       | NI    |                       |        |               |                        |                |
| bivalve    | Alabama spike            | <i>Elliptio arca</i>                   |                |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | delicate spike           | <i>Elliptio arctata</i>                | NI             |              |                      | MIIH     | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Atlantic spike           | <i>Elliptio producta</i>               |                |              |                      |          |                |           |                    |                                 |          |       |                       | NI     |               |                        |                |
| bivalve    | inflated spike           | <i>Elliptio purpurella</i>             |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Roanoke slabshell        | <i>Elliptio roanokensis</i>            |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  | NI     |               |                        |                |
| bivalve    | Texas pigtoe             | <i>Fusconaia askewi</i>                |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| bivalve    | Atlantic pigtoe          | <i>Fusconaia masoni</i>                |                |              |                      |          |                |           |                    | NI                              |          |       | NI                    |        |               |                        |                |
| bivalve    | longsolid mussel         | <i>Fusconaia subrotunda subrotunda</i> |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | yellow lampmussel        | <i>Lampsilis cariosa</i>               |                |              |                      |          |                |           |                    | NI                              |          |       |                       | NI     |               |                        |                |
| bivalve    | sandbank pocketbook      | <i>Lampsilis satura</i>                |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| bivalve    | Alabama heelsplitter     | <i>Lasmigona alabamensis</i>           | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Etowah heelsplitter      | <i>Lasmigona etowaensis</i>            | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Tennessee heelsplitter   | <i>Lasmigona holstonia</i>             |                |              |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| bivalve    | green floater            | <i>Lasmigona subviridis</i>            |                |              |                      |          |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| bivalve    | southern hickorynut      | <i>Obovaria jacksoniana</i>            |                |              |                      |          |                | NI        |                    |                                 | NI       |       |                       |        | MIIH          |                        |                |
| bivalve    | Alabama hickorynut       | <i>Obovaria unicolor</i>               |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Mississippi pigtoe       | <i>Pleurobema beadleianum</i>          |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Ohio pigtoe              | <i>Pleurobema cordatum</i>             |                |              |                      |          |                |           |                    | NI                              | NI       |       |                       |        |               |                        |                |
| bivalve    | Tennessee clubshell      | <i>Pleurobema oviforme</i>             |                | NI           |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| bivalve    | pink pigtoe              | <i>Pleurobema pyramidatum</i>          |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Louisiana pigtoe         | <i>Pleurobema riddellii</i>            |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| bivalve    | pyramid pigtoe           | <i>Pleurobema rubrum</i>               |                |              |                      |          |                |           | NI                 | NI                              | NI       |       |                       |        |               |                        |                |
| bivalve    | Tennessee pigtoe         | <i>Pleurobema barnesiana</i>           |                |              |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| bivalve    | Texas heelsplitter       | <i>Potamilus amphichaenus</i>          |                |              |                      |          |                |           |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| bivalve    | salamander mussel        | <i>Simpsonaias ambigua</i>             |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Alabama creekmussel      | <i>Strophitus connasaugaensis</i>      | NI             |              | MIIH                 | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | southern creekmussel     | <i>Strophitus subvexus</i>             | NI             |              |                      |          |                | NI        | NI                 |                                 |          |       |                       |        |               |                        |                |
| bivalve    | southern purple lilliput | <i>Toxolasma corvunculus</i>           | NI             |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | purple lilliput          | <i>Toxolasma lividum</i>               |                | NI           | MIIH                 |          |                |           |                    | NI                              | NI       | NI    |                       |        |               |                        |                |
| bivalve    | savannah lilliput        | <i>Toxolasma pullus</i>                |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| bivalve    | Ouachita creekshell      | <i>Villosa arkansasensis</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| bivalve    | Alabama rainbow          | <i>Villosa nebulosa</i>                | NI             |              | MIIH                 | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Coosa creekshell         | <i>Villosa umbrans</i>                 | NI             |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| bivalve    | Carolina creekshell      | <i>Villosa vaughaniana</i>             |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| crustacean | incurved cave isopod     | <i>Caecidotea incurva</i>              |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | big south fork crayfish  | <i>Cambarus bouchardi</i>              |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |

| category   | Common name                         | Scientific name                 | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|------------|-------------------------------------|---------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| crustacean | Boston Mountains crayfish           | <i>Cambarus causeyi</i>         |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| crustacean | chauga crayfish                     | <i>Cambarus chaugaensis</i>     |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  | NI     |               |                        |                |
| crustacean | mountain crayfish                   | <i>Cambarus conasaugaensis</i>  |                |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Conasaugu blue burrower             | <i>Cambarus cymatilis</i>       |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Chickamauga crayfish                | <i>Cambarus extraneus</i>       |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Little Tennessee River crayfish     | <i>Cambarus georgiae</i>        |                |              | MIIH                 |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| crustacean | Hiwassee headwaters crayfish        | <i>Cambarus parrishi</i>        |                |              | MIIH                 |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| crustacean | beautiful crayfish                  | <i>Cambarus speciosus</i>       |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Guyandotte River crayfish           | <i>Cambarus veteranus</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | amphipod                            | <i>Crangonyx castellanum</i>    |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Florida cave amphipod               | <i>Crangonyx grandimanus</i>    |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Hobb's cave amphipod                | <i>Crangonyx hobbsi</i>         |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Piedmont Prairie Burrowing Crayfish | <i>Distocambarus crockeri</i>   |                |              |                      |          |                |           |                    |                                 |          |       |                       | NI     |               |                        |                |
| crustacean | Newberry burrowing crayfish         | <i>Distocambarus youngineri</i> |                |              |                      |          |                |           |                    |                                 |          |       |                       | NI     |               |                        |                |
| crustacean | speckled burrowing crayfish         | <i>Fallicambarus danielae</i>   |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| crustacean | Camp Shelby burrowing crayfish      | <i>Fallicambarus gordonii</i>   |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| crustacean | sabine burrowing crayfish           | <i>Fallicambarus wallsi</i>     |                |              |                      |          |                |           |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| crustacean | Mena crayfish                       | <i>Faxonius menae</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| crustacean | an isopod                           | <i>Lirceus bicuspidatus</i>     |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| crustacean | isopod                              | <i>Miktoniscus racovitzai</i>   |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Appalachian cave crayfish           | <i>Orconectes packardi</i>      |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Kiamichi crayfish                   | <i>Orconectes saxatilis</i>     |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| crustacean | William's crayfish                  | <i>Orconectes williamsi</i>     |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| crustacean | Silver Glen Springs crayfish        | <i>Procambarus attiguis</i>     |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Jackson prairie crayfish            | <i>Procambarus barbiger</i>     |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| crustacean | Bigcheek Cave crayfish              | <i>Procambarus delicatus</i>    |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | spinytail crayfish                  | <i>Procambarus fitzpatricki</i> |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| crustacean | Big Blue Spring crayfish            | <i>Procambarus horsti</i>       |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |

| category   | Common name                     | Scientific name                   | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|------------|---------------------------------|-----------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| crustacean | Woodville Karst cave crayfish   | <i>Procambarus orcinus</i>        |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | Irons Fork burrowing crayfish   | <i>Procambarus reimeri</i>        |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| crustacean | a cave springtail               | <i>Pygmarrhopalites sacer</i>     |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | swimming Florida cave isopod    | <i>Remasellus parvus</i>          |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| crustacean | James Cave amphipod             | <i>Stygobromus abditus</i>        |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Carolina seep scud              | <i>Stygobromus carolinensis</i>   |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| crustacean | Greenbrier Cave amphipod        | <i>Stygobromus emarginatus</i>    |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Shenandoah Valley cave amphipod | <i>Stygobromus gracilipes</i>     |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Alleghany County cave amphipod  | <i>Stygobromus hoffmani</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Bath County cave amphipod       | <i>Stygobromus mundus</i>         |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | Least Cave stygobromid          | <i>Stygobromus pollostus</i>      |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| crustacean | spiny cave stygobromid          | <i>Stygobromus spinatus</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish       | lake sturgeon                   | <i>Acipenser fulvescens</i>       |                | NI           |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | Alabama shad                    | <i>Alosa alabamae</i>             | NI             |              |                      |          | MIIH           |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| fish       | western sand darter             | <i>Ammocrypta clara</i>           |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        | MIIH          |                        |                |
| fish       | crystal darter                  | <i>Crystallaria asprella</i>      | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | bluestripe shiner               | <i>Cyprinella callitaenia</i>     |                |              |                      | MIIH     |                | MIIH      |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | blotched chub                   | <i>Erimystax insignis</i>         |                | NI           |                      | MIIH     | MIIH           |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| fish       | sharphead darter                | <i>Etheostoma acuticeps</i>       |                |              |                      |          | MIIH           |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| fish       | warrior darter                  | <i>Etheostoma bellator</i>        | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | holiday darter                  | <i>Etheostoma brevirostrum</i>    | NI             |              |                      | MIIH     | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | ashy darter                     | <i>Etheostoma cinereum</i>        |                | NI           |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish       | coldwater darter                | <i>Etheostoma ditrema</i>         | NI             |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | Tuskaloosa darter               | <i>Etheostoma douglasi</i>        | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | spotted darter                  | <i>Etheostoma maculatum</i>       |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | paleback darter                 | <i>Etheostoma pallidorsum</i>     |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish       | yazoo darter                    | <i>Etheostoma raneyi</i>          |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| fish       | arrow darter                    | <i>Etheostoma sagitta sagitta</i> |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish       | Tippecanoe darter               | <i>Etheostoma tippecanoe</i>      |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish       | wounded darter                  | <i>Etheostoma vulneratum</i>      |                |              |                      | MIIH     | MIIH           |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| fish       | lined chub                      | <i>Hybopsis lineapunctata</i>     | NI             |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |

| category  | Common name              | Scientific name                   | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|-----------|--------------------------|-----------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| fish      | northern brook lamprey   | <i>Ichthyomyzon fossor</i>        |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | mountain brook lamprey   | <i>Ichthyomyzon greeleyi</i>      |                | NI           |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | Ouachita shiner          | <i>Lythrurus snelsoni</i>         |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | redeye bass              | <i>Micropterus coosae</i>         |                |              |                      | MIIH     |                |           |                    |                                 |          |       | MIIH                  | NI     |               |                        |                |
| fish      | Suwannee bass            | <i>Micropterus notius</i>         |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | robust redhorse          | <i>Moxostoma robustum</i>         |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       | NI     |               |                        |                |
| fish      | Apalachicola redhorse    | <i>Moxostoma sp. 1</i>            |                |              | MIIH                 |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | popeye shiner            | <i>Notropis ariommus</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | bridle shiner            | <i>Notropis bifrenatus</i>        |                |              |                      |          |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| fish      | ironcolor shiner         | <i>Notropis chalybaeus</i>        | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| fish      | Kiamichi shiner          | <i>Notropis ortenburgeri</i>      |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | Ozark shiner             | <i>Notropis ozarcanus</i>         |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| fish      | peppered shiner          | <i>Notropis perpallidus</i>       |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | roughhead shiner         | <i>Notropis semperasper</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | rocky shiner             | <i>Notropis suttkusi</i>          |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | skygazer shiner          | <i>Notropis uranoscopus</i>       | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | orangefin madtom         | <i>Noturus gilberti</i>           |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | piebald madtom           | <i>Noturus gladiator</i>          |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| fish      | Ouachita madtom          | <i>Noturus lachneri</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | frecklebelly madtom      | <i>Noturus munitus</i>            | NI             |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | northern madtom          | <i>Noturus stigmosus</i>          |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | caddo madtom             | <i>Noturus taylori</i>            |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | Ouachita darter          | <i>Percina brucehompsoni</i>      |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | blotchside darter        | <i>Percina burtoni</i>            |                |              |                      | MIIH     |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| fish      | bridled darter           | <i>Percina kusha</i>              |                |              | MIIH                 | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | longhead darter          | <i>Percina macrocephala</i>       |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | longnose darter          | <i>Percina nasuta</i>             |                |              |                      |          |                |           |                    |                                 | NI       | NI    |                       |        |               |                        |                |
| fish      | bankhead darter          | <i>Percina sipsi</i>              | NI             |              |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| fish      | olive darter             | <i>Percina squamata</i>           |                | NI           | MIIH                 | MIIH     |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| fish      | stargazing darter        | <i>Percina uranidea</i>           |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| fish      | sickle darter            | <i>Percina williamsi</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | Kanawha minnow           | <i>Phenacobius teretulus</i>      |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| fish      | bluenose shiner          | <i>Pteronotropis welaka</i>       |                |              |                      |          | MIIH           |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| fish      | southern cavefish        | <i>Typhlichthys subterraneus</i>  |                | NI           |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| flatworm  | a planarian              | <i>Geocentrophora cavernicola</i> |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| flatworm  | a planarian              | <i>Geocentrophora cavernicola</i> |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | Pine Mountain tigersnail | <i>Anguispira rugoderma</i>       |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | dense hydrobe            | <i>Aphaostracon pycnus</i>        |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | knotty elimia            | <i>Elimia christyi</i>            |                |              |                      | MIIH     |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| gastropod | Alexander siltsnail      | <i>Floridobia alexander</i>       |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | flatwood siltsnail       | <i>Floridobia leptospira</i>      |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | organ cavesnail          | <i>Fontigens tartarea</i>         |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |

| category  | Common name                           | Scientific name                   | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|-----------|---------------------------------------|-----------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| gastropod | Archer's toothed landsnail            | <i>Fumonelix archeri</i>          |                |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | clifty covert                         | <i>Fumonelix wetherbyi</i>        |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | Appalachia bellytooth                 | <i>Gastrodonta fonticola</i>      |                | NI           |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | blue-gray glyph                       | <i>Glyphyalinia ocoae</i>         |                |              |                      | MIIH     |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| gastropod | Maryland glyph                        | <i>Glyphyalinia raderi</i>        |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | shaggy coil                           | <i>Helicodiscus diadema</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | talus coil                            | <i>Helicodiscus triodus</i>       |                |              |                      |          |                |           |                    | NI                              |          |       | NI                    |        |               |                        |                |
| gastropod | Magazine Mountain shagreen            | <i>Inflectarius magazinensis</i>  |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| gastropod | velvet covert                         | <i>Inflectarius subpalliatu</i>   |                |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | spiny river snail                     | <i>Lo fluvialis</i>               |                |              |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | smooth rocksnail                      | <i>Leptoxis virgata</i>           |                |              |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | wrinkled button                       | <i>Mesomphix rugeli</i>           |                | NI           |                      | MIIH     |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | brown supercoil                       | <i>Paravitrea septadens</i>       |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | shortspire hornsnail                  | <i>Pleurocera curta</i>           |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | upland hornsnail                      | <i>Pleurocera showalteri</i>      |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | domed ancyliid                        | <i>Rhodacme elatior</i>           | NI             | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| gastropod | highland slitmouth                    | <i>Stenotrema altispira</i>       |                |              |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | Pilsbry's narrow-apertured land snail | <i>Stenotrema pilsbryi</i>        |                |              |                      |          |                |           |                    |                                 | NI       |       |                       |        |               |                        |                |
| gastropod | crossed dome                          | <i>Ventridens decussatus</i>      |                |              |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | delicate vertigo                      | <i>Vertigo bollesiana</i>         |                | NI           |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| gastropod | cupped vertigo snail                  | <i>Vertigo clappi</i>             |                | NI           |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | a caddisfly                           | <i>Agapetus jocassee</i>          |                |              |                      |          |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| insect    | Smokies snowfly                       | <i>Allocapnia fumosa</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | arogos skipper                        | <i>Atrytone arogos</i>            |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | loammi skipper                        | <i>Atrytonopsis loammi</i>        |                |              |                      |          | MIIH           |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| insect    | Georgia stone                         | <i>Beloneuria georgiana</i>       |                |              | MIIH                 |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect    | Jefferson's short-nosed scorpionfly   | <i>Brachypanorpa jeffersoni</i>   |                |              |                      | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | northern metalmark                    | <i>Calephelis borealis</i>        |                | NI           |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | frosted elfin                         | <i>Callophrys irus</i>            |                | NI           |                      | MIIH     | MIIH           |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| insect    | Gerhard's underwing                   | <i>Catocala herodias gerhardi</i> |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | marbled underwing                     | <i>Catocala marmorata</i>         |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | Northern Barrens tiger beetle         | <i>Cicindela patruela</i>         |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | Sarracenia spiketail                  | <i>Cordulegaster sarracenia</i>   |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| insect    | monarch butterfly                     | <i>Danaus plexippus</i>           | NI             | NI           | MIIH                 | MIIH     | MIIH           | NI        | NI                 | NI                              | NI       | NI    | MIIH                  | NI     | MIIH          | NI                     |                |
| insect    | early hairstreak                      | <i>Erora laeta</i>                |                | NI           |                      |          | MIIH           |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | mottled duskywing                     | <i>Erynnis martialis</i>          |                |              |                      | MIIH     | MIIH           |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| insect    | Persius duskywing                     | <i>Erynnis persius persius</i>    |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect    | Milne's looper moth                   | <i>Euchlaena milnei</i>           |                |              |                      |          |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| insect    | green pitcher plant moth              | <i>Exyra ridingsii</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |

| category | Common name                                 | Scientific name                      | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|----------|---|--------------------------------------|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| insect   | Cherokee clubtail                           | <i>Gomphus consanguis</i>            |                |              | MIIH                 | MIIH     |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| insect   | green-faced clubtail                        | <i>Gomphus viridifrons</i>           |                |              |                      | NI       |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Chukcho stonefly                            | <i>Haploperla chukcho</i>            |                |              |                      |          |                |           | NI                 |                                 |          |       |                       |        |               |                        |                |
| insect   | Wakulla Springs vari-colored microcaddisfly | <i>Hydroptila wakulla</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | arrowhead stripetail                        | <i>Isoperla sagittata</i>            |                |              |                      |          |                |           |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| insect   | Schoolhouse Springs leuctran stonefly       | <i>Leuctra szczytkoi</i>             |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | purple skimmer                              | <i>Libellula jesseana</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | a limnephelid caddisfly                     | <i>Manophylax butleri</i>            |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | Smiokies Needlefly                          | <i>Megaleuctra williamsae</i>        |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Ocala clawcercus grasshopper                | <i>Melanoplus nanciae</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | Edmund's snaketail                          | <i>Ophiogomphus edmundo</i>          |                |              | MIIH                 | MIIH     |                |           |                    |                                 |          |       | MIIH                  | NI     |               |                        |                |
| insect   | pygmy snaketail                             | <i>Ophiogomphus howei</i>            |                | NI           |                      |          |                |           |                    | NI                              |          |       | MIIH                  |        |               |                        |                |
| insect   | Appalachian snaketail                       | <i>Ophiogomphus incurvatus</i>       |                |              |                      | MIIH     |                |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| insect   | nearctic paduniellan caddisfly              | <i>Paduniella nearctica</i>          |                |              |                      |          |                |           |                    |                                 |          | NI    |                       |        |               |                        |                |
| insect   | silphius borer moth                         | <i>Papaipema silphii</i>             |                | NI           |                      |          |                |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | Young's deepdigger scarab                   | <i>Peltotrupes youngi</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | Avernus Cave beetle                         | <i>Pseudanophthalmus avernus</i>     |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Little Kennedy Cave beetle                  | <i>Pseudanophthalmus cordicollis</i> |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Crossroads cave beetle                      | <i>Pseudanophthalmus intersectus</i> |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Appalachian grizzled skipper                | <i>Pyrgus wyandot</i>                |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Calvert's emerald                           | <i>Somatochlora calverti</i>         |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| insect   | Texas emerald                               | <i>Somatochlora margarita</i>        |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| insect   | regal fritillary                            | <i>Speyeria idalia</i>               |                |              |                      |          |                |           |                    | NI                              |          | NI    | MIIH                  |        |               |                        |                |
| insect   | cryptic willowfly                           | <i>Taeniopteryx nelsoni</i>          |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| insect   | Okefenokee zale moth                        | <i>Zale perculata</i>                |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| mammal   | Rafinesque's big-eared bat                  | <i>Corynorhinus rafinesquii</i>      | NI             | NI           | MIIH                 | MIIH     | MIIH           | NI        | NI                 | NI                              |          | NI    |                       | NI     | MIIH          | NI                     |                |
| mammal   | Virginia northern flying squirrel           | <i>Glaucomys sabrinus fuscus</i>     |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| mammal   | southeastern myotis                         | <i>Myotis austroriparius</i>         | NI             | NI           |                      |          | NI             | NI        | NI                 |                                 | NI       | NI    | NI                    | NI     | NI            |                        |                |
| mammal   | eastern small-footed myotis                 | <i>Myotis leibii</i>                 |                | NI           | MIIH                 | MIIH     |                |           |                    | NI                              | NI       | NI    | MIIH                  | MIIH   |               | NI                     |                |
| mammal   | tri-colored bat                             | <i>Perimyotis subflavus</i>          | NI             | NI           | MIIH                 | MIIH     | MIIH           | NI        | NI                 | NI                              | NI       | NI    | MIIH                  | NI     | MIIH          | NI                     |                |
| mammal   | Florida mouse                               | <i>Podomys floridanus</i>            |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| mammal   | Sherman's fox squirrel                      | <i>Sciurus niger shermani</i>        |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |

| category | Common name                     | Scientific name   | NFs of Alabama | Daniel Boone | Chattahoochee-Oconee | Cherokee | NFs of Florida | Kisatchie | NFs of Mississippi | George Washington and Jefferson | Ouachita | Ozark | NFs of North Carolina | Sumter | NF&G of Texas | Land Between the Lakes | Savannah River |
|----------|---------------------------------|---|----------------|--------------|----------------------|----------|----------------|-----------|--------------------|---------------------------------|----------|-------|-----------------------|--------|---------------|------------------------|----------------|
| mammal   | Louisiana black bear            | <i>Ursus americanus luteolus</i>                        |                |              |                      |          |                | NI        | NI                 |                                 |          |       |                       |        |               |                        |                |
| myriapod | montana centipede               | <i>Escaryus cryptorobius</i>                            |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| myriapod | Whitetop Mountain centipede     | <i>Escaryus orestes</i>                                 |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| reptile  | spotted turtle                  | <i>Clemmys guttata</i>                                  |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| reptile  | eastern diamondback rattlesnake | <i>Crotalus adamanteus</i>                              | NI             |              |                      |          | MIIH           |           | NI                 |                                 |          |       | MIIH                  |        |               |                        |                |
| reptile  | wood turtle                     | <i>Glyptemys insculpta</i>                              |                |              |                      |          |                |           |                    | NI                              |          |       |                       |        |               |                        |                |
| reptile  | bog turtle                      | <i>Glyptemys muhlenbergii</i>                           |                |              | NI                   | NI       |                |           |                    | NI                              |          |       | NI                    |        |               |                        |                |
| reptile  | gopher tortoise                 | <i>Gopherus polyphemus</i>                              |                |              | MIIH                 |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |
| reptile  | Barbour's map turtle            | <i>Graptemys barbouri</i>                               |                |              |                      |          | NI             |           |                    |                                 |          |       |                       |        |               |                        |                |
| reptile  | southern hognose snake          | <i>Heterodon simus</i>                                  |                |              |                      |          | MIIH           |           |                    |                                 |          |       | MIIH                  |        |               |                        |                |
| reptile  | pine snake                      | <i>Pituophis melanoleucus [excluding P. m. lodingi]</i> |                |              | MIIH                 | MIIH     |                |           |                    | NI                              |          |       |                       |        |               |                        | NI             |
| reptile  | Louisiana pinesnake             | <i>Pituophis ruthveni</i>                               |                |              |                      |          |                | NI        |                    |                                 |          |       |                       |        | MIIH          |                        |                |
| reptile  | Florida scrub lizard            | <i>Sceloporus woodi</i>                                 |                |              |                      |          | MIIH           |           |                    |                                 |          |       |                       |        |               |                        |                |

VERSION 7/3/2023



| Category  | Common name                         | scientific name                         | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|-----------|-------------------------------------|---|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| amphibian | Jefferson Salamander                | <i>Ambystoma jeffersonianum</i>         |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| amphibian | Blue-spotted Salamander             | <i>Ambystoma laterale</i>               |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| amphibian | Green Salamander                    | <i>Aneides aeneus</i>                   |           |                     |          |                                 |          | NI      |                |            |         | NI          |        |         |          | NI    |                |
| amphibian | Eastern Hellbender                  | <i>Cryptobranchus alleganiensis</i>     | NI        |                     |          |                                 |          |         |                | NI         |         | NI          |        |         |          | NI    |                |
| amphibian | Eastern Narrow-mouth Toad           | <i>Gastrophryne carolinensis</i>        |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| amphibian | Four-toed Salamander                | <i>Hemidactylium scutatum</i>           | NI        |                     | MIH      | NI                              |          | NI      |                |            |         |             | NI     |         |          | NI    |                |
| amphibian | Bird-voiced Treefrog                | <i>Hyla avivoca</i>                     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| amphibian | mudpuppy                            | <i>Necturus maculosus</i>               |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| amphibian | Illinois Chorus Frog                | <i>Pseudacris streckeri illinoensis</i> |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| amphibian | Mud Salamander                      | <i>Pseudotriton montanus</i>            |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          | NI    |                |
| amphibian | Plains Leopard Frog                 | <i>Rana blairi</i>                      |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| arachnid  | Southeastern Wandering Spider       | <i>Anahita punctulata</i>               |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | A Pseudoscorpion                    | <i>Apochthonius indianensis</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | Dry Fork Valley Cave Pseudoscorpion | <i>Apochthonius paucispinosus</i>       |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| arachnid  | A Cave Obligate Harvestman          | <i>Erebomaster flavescens</i>           |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | Southeastern Cave Pseudoscorpion    | <i>Hesperochernes mirabilis</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | Gray-handed Pseudoscorpion          | <i>Kleptochthonius griseomanus</i>      |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | A Cave Obligate Pseudoscorpion      | <i>Kleptochthonius packardi</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | A Cave Spider                       | <i>Nesticus carteri</i>                 |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | Beatty's Cave Sheet-web Spider      | <i>Oreonetides beattyi</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | Appalachian Cave Spider             | <i>Porrhomma cavernicola</i>            |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| arachnid  | A Gnaphosid Spider                  | <i>Talanites exlineae</i>               |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| bird      | Northern Goshawk                    | <i>Accipiter gentilis</i>               | NI        |                     | MIH      | NI                              | NI       |         | NI             |            |         | NI          |        |         |          | MIH   |                |
| bird      | Boreal Owl                          | <i>Aegolius funereus</i>                |           |                     |          |                                 |          |         |                |            |         |             |        |         |          | MIH   |                |
| bird      | Henslow's Sparrow                   | <i>Ammodramus henslowii</i>             |           |                     |          | NI                              |          | NI      | NI             |            |         | NI          |        | NI      |          |       | NI             |
| bird      | Le Conte's Sparrow                  | <i>Ammodramus leconteii</i>             |           | MIH                 | MIH      |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bird      | Nelson's Sparrow                    | <i>Ammodramus nelsoni</i>               |           |                     | NI       |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bird      | Grasshopper Sparrow                 | <i>Ammodramus savannarum</i>            |           |                     |          | NI                              |          |         | NI             |            |         |             |        |         |          |       |                |
| bird      | Short-eared Owl                     | <i>Asio flammeus</i>                    |           |                     |          | NI                              | NI       |         |                |            | NI      |             |        |         |          |       |                |
| bird      | Long-eared Owl                      | <i>Asio otus</i>                        |           |                     |          |                                 | NI       |         | NI             |            |         | NI          |        |         |          |       |                |
| bird      | Upland Sandpiper                    | <i>Bartramia longicauda</i>             |           | NI                  |          | NI                              |          |         |                |            | NI      |             |        |         |          |       |                |
| bird      | Ruffed Grouse                       | <i>Bonasa umbellus</i>                  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| bird      | American Bittern                    | <i>Botaurus lentiginosus</i>            |           |                     |          |                                 |          |         | NI             |            | NI      |             |        |         |          |       |                |
| bird      | Red-shouldered Hawk                 | <i>Buteo lineatus</i>                   |           | NI                  | NI       |                                 | NI       |         | NI             |            |         |             | NI     |         |          |       |                |

| Category | Common name                    | scientific name                    | Allegheny | Chequamagon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|--------------------------------|------------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| bird     | whip-poor-will                 | <i>Caprimulgus vociferus</i>       |           |                     |          |                                 |          |         |                |            |         |             |        |         |          | NI    |                |
| bird     | Bicknell's Thrush              | <i>Catharus bicknelli</i>          |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       | NI             |
| bird     | Swainson's Thrush              | <i>Catharus ustulatus</i>          | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Black Tern                     | <i>Chlidonias niger</i>            |           |                     |          |                                 | NI       |         | NI             |            |         |             |        |         |          |       |                |
| bird     | Northern Harrier               | <i>Circus cyaneus</i>              |           |                     |          | NI                              |          |         |                |            | NI      |             |        |         |          |       |                |
| bird     | black-billed cuckoo            | <i>Coccyzus erythrophthalmus</i>   |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| bird     | northern bobwhite              | <i>colinus virginianus</i>         |           |                     |          |                                 |          |         |                |            |         |             |        |         |          | NI    |                |
| bird     | Olive-sided Flycatcher         | <i>Contopus cooperi</i>            |           |                     |          |                                 |          |         | NI             |            |         | NI          |        |         |          | MIIH  |                |
| bird     | Yellow Rail                    | <i>Coturnicops noveboracensis</i>  |           |                     |          | NI                              | NI       |         |                |            |         |             |        |         |          |       |                |
| bird     | Trumpeter Swan                 | <i>Cygnus buccinator</i>           |           |                     |          |                                 | NI       |         | NI             |            |         |             |        |         |          |       |                |
| bird     | Bobolink                       | <i>Dolichonyx oryzivorus</i>       |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| bird     | Rusty Blackbird                | <i>Euphagus carolinus</i>          |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Spruce Grouse                  | <i>Falcapennis canadensis</i>      |           | NI                  |          | MIIH                            |          |         | NI             |            |         |             | NI     |         |          |       |                |
| bird     | American Peregrine Falcon      | <i>Falco peregrinus anatum</i>     |           |                     |          | NI                              | NI       |         |                |            |         | NI          |        |         |          |       | NI             |
| bird     | common gallinule               | <i>Gallinula galeata</i>           |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| bird     | Common Loon                    | <i>Gavia immer</i>                 |           |                     |          | NI                              | NI       |         | NI             |            |         |             | NI     |         |          |       | NI             |
| bird     | Bald Eagle                     | <i>Haliaeetus leucocephalus</i>    |           | NI                  |          | MIIH                            |          |         | NI             |            | NI      | NI          |        |         |          |       |                |
| bird     | Caspian Tern                   | <i>Hydroprogne caspia</i>          |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Least Bittern                  | <i>Ixobrychus exilis</i>           |           |                     |          |                                 |          |         | NI             |            | NI      |             |        |         |          |       |                |
| bird     | Migrant Loggerhead Shrike      | <i>Lanius ludovicianus migrans</i> |           |                     |          |                                 |          | NI      |                |            | NI      | NI          |        | NI      |          |       |                |
| bird     | Swainson's Warbler             | <i>Limnothlypis swainsonii</i>     |           |                     |          |                                 |          |         |                | NI         |         |             |        |         | NI       |       |                |
| bird     | Red-headed Woodpecker          | <i>Melanerpes erythrocephalus</i>  |           |                     |          |                                 |          |         | NI             |            | NI      | NI          |        |         |          |       |                |
| bird     | Connecticut Warbler            | <i>Oporornis agilis</i>            |           | NI                  |          | MIIH                            | NI       |         |                |            |         |             | NI     |         | MIIH     |       |                |
| bird     | Nashville warbler              | <i>Oreothlypis ruficapilla</i>     |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| bird     | Osprey                         | <i>Pandion haliaetus</i>           |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| bird     | Louisiana waterthrush          | <i>Parkesia motacilla</i>          |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| bird     | northern waterthrush           | <i>Parkesia noveboracensis</i>     |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| bird     | Bachman's Sparrow              | <i>Peucaea aestivalis</i>          |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bird     | Wilson's Phalarope             | <i>Phalaropus tricolor</i>         |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Black-backed Woodpecker        | <i>Picoides arcticus</i>           |           | NI                  |          | MIIH                            | NI       |         | NI             |            |         |             | NI     |         |          |       |                |
| bird     | American Three-toed Woodpecker | <i>Picoides dorsalis</i>           |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| bird     | Pied-billed Grebe              | <i>Podilymbus podiceps</i>         |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| bird     | Vesper Sparrow                 | <i>Pooecetes gramineus</i>         |           |                     |          | NI                              |          |         |                |            |         | NI          |        |         |          |       |                |
| bird     | King Rail                      | <i>Rallus elegans</i>              |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| bird     | American Woodcock              | <i>Scolopax minor</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| bird     | Cerulean Warbler               | <i>Setophaga cerulea</i>           |           | NI                  |          |                                 |          | NI      | NI             | NI         | NI      |             |        | NI      |          | NI    |                |
| bird     | Prairie Warbler                | <i>Setophaga discolor</i>          |           |                     |          |                                 | NI       |         | NI             |            |         | NI          |        |         |          |       |                |
| bird     | Clay-colored Sparrow           | <i>Spizella pallida</i>            |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Common Tern                    | <i>Sterna hirundo</i>              |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| bird     | Great Gray Owl                 | <i>Strix nebulosa</i>              |           |                     |          | MIIH                            |          |         |                |            |         |             |        |         | MIIH     |       |                |

| Category   | Common name                     | scientific name                    | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|------------|---------------------------------|------------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| bird       | Sharp-tailed Grouse             | <i>Tympanuchus phasianellus</i>    |           | NI                  |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| bird       | Barn Owl                        | <i>Tyto alba</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| bird       | Golden-winged Warbler           | <i>Vermivora chrysoptera</i>       |           |                     |          |                                 | NI       |         |                |            |         | NI          |        |         |          |       |                |
| bivalve    | Elktoe                          | <i>Alasmidonta marginata</i>       |           |                     |          |                                 |          |         |                | MIIH       |         | NI          |        |         |          |       |                |
| bivalve    | Brook Floater                   | <i>Alasmidonta varicosa</i>        |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Slippershell Mussel             | <i>Alasmidonta viridis</i>         |           |                     |          |                                 | NI       |         | NI             | MIIH       |         |             |        |         |          |       |                |
| bivalve    | Threeridge                      | <i>Amblyma plicata</i>             | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | flat floater                    | <i>Anodonta suborbiculata</i>      |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | Western Fanshell                | <i>Cyprogenia aberti</i>           |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | elephantear                     | <i>Elliptio crassidens</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | ebonyshell                      | <i>Fusconaia ebena</i>             |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | Wabash Pigtoe                   | <i>Fusconaia flava</i>             | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Longsolid                       | <i>Fusconaia subrotunda</i>        | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Northern Brokenray              | <i>Lampsilis reeveiana brittsi</i> |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | White Heelsplitter              | <i>Lasmigona complanata</i>        | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Creek Heelsplitter              | <i>Lasmigona compressa</i>         | NI        |                     |          | NI                              |          |         | NI             |            |         |             | NI     |         | NI       |       |                |
| bivalve    | Flutedshell                     | <i>Lasmigona costata</i>           |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Green Floater                   | <i>Lasmigona subviridis</i>        |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| bivalve    | Arkansas mudalia                | <i>Leptoxis arkansensis</i>        |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| bivalve    | eastern pondmussel              | <i>Ligumia nasuta</i>              |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| bivalve    | Black Sandshell                 | <i>Ligumia recta</i>               |           |                     |          |                                 |          |         | NI             | MIIH       |         |             |        | NI      | NI       |       |                |
| bivalve    | Ohio Pigtoe                     | <i>Pleurobema cordatum</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| bivalve    | Round Pigtoe                    | <i>Pleurobema sintoxia</i>         | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Ouachita Kidneyshell            | <i>Ptychobranthus occidentalis</i> |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| bivalve    | Salamander Mussel               | <i>Simpsonaias ambigua</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          | NI    |                |
| bivalve    | Purple Lilliput                 | <i>Toxolasma lividum</i>           |           |                     |          |                                 |          |         |                | MIIH       |         |             |        | NI      |          |       |                |
| bivalve    | Ellipse                         | <i>Venustaconcha ellipsiformis</i> |           | NI                  |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| bivalve    | Rainbow                         | <i>Villosa iris</i>                | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| bivalve    | Little Spectaclecase            | <i>Villosa lienosa</i>             |           |                     |          |                                 |          |         |                |            |         |             |        |         |          | NI    |                |
| crustacean | Hubricht's Long-tailed Amphipod | <i>Allocrangonyx hubrichti</i>     |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Short-tail Bactruid             | <i>Bactrurus brachycaudus</i>      |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | A Cave Obligate Isopod          | <i>Caecidotea bicrenata whitei</i> |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Cannulate Cave Isopod           | <i>Caecidotea cannula</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | An Isopod                       | <i>Caecidotea dimorpha</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Holsinger's Cave Isopod         | <i>Caecidotea holsingeri</i>       |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | A Cave Obligate Isopod          | <i>Caecidotea simonini</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | A Cave Isopod                   | <i>Caecidotea sinuncus</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | A Cave Isopod                   | <i>Caecidotea stygia</i>           |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Elk River Crayfish              | <i>Cambarus elkensis</i>           |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | Greenbrier Cave Crayfish        | <i>Cambarus nerterius</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |

| Category   | Common name                 | scientific name                     | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|------------|-----------------------------|-------------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| crustacean | Greenbrier River crayfish   | <i>Cambarus smilax</i>              |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| crustacean | Northern Cavefish Copepod   | <i>Cauloxenus stygius</i>           |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Anomalous Spring Amphipod   | <i>Crangonyx anomalus</i>           |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Barr's Cave Amphipod        | <i>Crangonyx barri</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Indiana Cave Amphipod       | <i>Crangonyx indianensis</i>        |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Packard Cave Amphipod       | <i>Crangonyx packardi</i>           |           |                     |          |                                 |          | NI      |                |            |         |             |        | NI      |          |       |                |
| crustacean | A Cave Obligate Copepod     | <i>Diacyclops jeanneli jeanneli</i> |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Bousfield's Amphipod        | <i>Gammarus bousfieldi</i>          |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Donnaldson's Cave Copepod   | <i>Megacyclops donnaldsoni</i>      |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Coldwater Crayfish          | <i>Orconectes eupunctus</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Indiana Crayfish            | <i>Orconectes indianensis</i>       |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Ghost Crayfish              | <i>Orconectes inermis inermis</i>   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Kentucky Crayfish           | <i>Orconectes kentuckiensis</i>     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | Meek's Crayfish             | <i>Orconectes meeki</i>             |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Big Creek Crayfish          | <i>Orconectes peruncus</i>          |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Bigclaw Crayfish            | <i>Orconectes placidus</i>          |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| crustacean | St. Francis River Crayfish  | <i>Orconectes quadruncus</i>        |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Sinkhole Crayfish           | <i>Orconectes theaphionensis</i>    |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Williams Crayfish           | <i>Orconectes williamsi</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| crustacean | Jeannel's Cave Ostracod     | <i>Pseudocandona jeanneli</i>       |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Indiana Groundwater Copepod | <i>Rheocyclops indiana</i>          |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| crustacean | Culver's Cave Amphipod      | <i>Stygobromus culveri</i>          |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| crustacean | Greenbrier Cave Amphipod    | <i>Stygobromus emarginatus</i>      |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| crustacean | Franz's Cave amphipod       | <i>Stygobromus franzi</i>           |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| crustacean | Pocahontas Cave Amphipod    | <i>Stygobromus nanus</i>            |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| crustacean | Minute Cave Amphipod        | <i>Stygobromus parvus</i>           |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| crustacean | Subtle Stygobromid          | <i>Stygobromus subtilis</i>         |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| fish       | Lake Sturgeon               | <i>Acipenser fulvescens</i>         |           | NI                  |          |                                 | NI       | NI      | NI             |            |         |             | NI     |         | MIIH     |       |                |
| fish       | Northern Cavefish           | <i>Amblyopsis spelaea</i>           |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| fish       | western sand darter         | <i>Ammocrypta clara</i>             |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish       | American eel                | <i>Anguilla rostrata</i>            |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |

| Category | Common name               | scientific name                      | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|---------------------------|--------------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| fish     | highfin carpsucker        | <i>Carpoides velifer</i>             |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Redside Dace              | <i>Clinostomus elongatus</i>         |           |                     |          |                                 |          |         |                |            |         | NI          | NI     |         |          | NI    |                |
| fish     | Nipigon Cisco             | <i>Coregonus nipigon</i>             |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| fish     | Shortjaw Cisco            | <i>Coregonus zenithicus</i>          |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| fish     | Crystal Darter            | <i>Crystallaria asprella</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Lake Chubsucker           | <i>Erimyzon sucetta</i>              |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          | NI    |                |
| fish     | Arkansas Saddled Darter   | <i>Etheostoma euzonum euzonum</i>    |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | harlequin darter          | <i>Etheostoma histrio</i>            |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Spotted Darter            | <i>Etheostoma maculatum</i>          | NI        |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| fish     | Least Darter              | <i>Etheostoma microperca</i>         |           |                     | MIIH     |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Candy Darter              | <i>Etheostoma osburni</i>            |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | tonguetied minnow         | <i>Exoglossum laurae</i>             |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | western silvery minnow    | <i>Hybognathus argyritis</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Ohio Lamprey              | <i>Ichthyomyzon bdellium</i>         | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          | NI    |                |
| fish     | Northern Brook Lamprey    | <i>Ichthyomyzon fossor</i>           |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| fish     | southern brook lamprey    | <i>Ichthyomyzon greeleyi</i>         |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Mountain Brook Lamprey    | <i>Ichthyomyzon greeleyi</i>         | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| fish     | Longear Sunfish           | <i>Lepomis megalotis</i>             |           |                     | MIIH     |                                 |          |         |                |            |         |             |        |         |          |       |                |
| fish     | Redspotted Sunfish        | <i>Lepomis miniatus</i>              |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| fish     | Bantam Sunfish            | <i>Lepomis symmetricus</i>           |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| fish     | Burbot                    | <i>Lota lota</i>                     | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| fish     | Pearl Dace                | <i>Margariscus margarita</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | Greater Redhorse          | <i>Moxostoma valenciennesi</i>       |           | NI                  | MIIH     |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| fish     | Pugnose Shiner            | <i>Notropis anogenus</i>             |           | NI                  | MIIH     |                                 |          |         |                |            |         |             |        |         |          |       |                |
| fish     | bigmouth shiner           | <i>Notropis dorsalis</i>             |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| fish     | Blacknose Shiner          | <i>Notropis heterolepis</i>          |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Ozark Shiner              | <i>Notropis ozarcanus</i>            |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Sabine Shiner             | <i>Notropis sabiniae</i>             |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | New River Shiner          | <i>Notropis scabriceps</i>           |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | Mountain Madtom           | <i>Noturus eleutherus</i>            | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| fish     | Northern Madtom           | <i>Noturus stigmosus</i>             | NI        |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| fish     | Cheat Minnow              | <i>Pararhinichthys bowersi</i>       |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | Channel Darter            | <i>Percina copelandi</i>             | NI        |                     |          |                                 |          | NI      | NI             |            |         |             |        |         |          |       |                |
| fish     | Bluestripe Darter         | <i>Percina cymatotaenia</i>          |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Appalachia Darter         | <i>Percina gymnocephala</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | Longnose Darter           | <i>Percina nasuta</i>                |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Stargazing Darter         | <i>Percina uranidea</i>              |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | Kanawha Minnow            | <i>Phenacobius teretulus</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| fish     | Eastern Slim Minnow       | <i>Pimephales tenellus parviceps</i> |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| fish     | southern cavefish         | <i>Typhlichthys subterraneus</i>     |           |                     |          |                                 |          |         |                | MIIH       |         |             |        |         |          |       |                |
| flatworm | A Cave Obligate Planarian | <i>Phagocata angusta</i>             |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| flatworm | Culver's Planarian        | <i>Sphalloplana culveri</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |

| Category  | Common name                  | scientific name                   | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|-----------|------------------------------|-----------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| flatworm  | A Cave Obligate Planarian    | <i>Sphalloplana hubrichti</i>     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| flatworm  | Weingartner's Cave Flatworm  | <i>Sphalloplana weingartneri</i>  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| gastropod | Pleistocene Catinella        | <i>Catinella exile</i>            |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | Carinate Pillsnail           | <i>Euchemotrema hubrichti</i>     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| gastropod | A Terrestrial Snail          | <i>Euconulus alderi</i>           |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | Organ Cavesnail              | <i>Fontigens tartarea</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| gastropod | Thin Glyph                   | <i>Glyphyalinia cryptomphala</i>  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| gastropod | smooth bladetooth            | <i>Patera laevior</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| gastropod | multirib vallonina           | <i>Vallonia gracilicosta</i>      |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | Delicate Vertigo             | <i>Vertigo bollesiana</i>         |           |                     |          |                                 | NI       |         |                |            |         |             | NI     |         |          |       |                |
| gastropod | tapered vertigo              | <i>Vertigo elatior</i>            |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | Bluff Vertigo                | <i>Vertigo meramecensis</i>       |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| gastropod | Six-whorl Vertigo            | <i>Vertigo morsei</i>             |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | deep-throat vertigo          | <i>Vertigo nylanderii</i>         |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| gastropod | Mystery Vertigo              | <i>Vertigo paradoxa</i>           |           |                     |          |                                 | NI       |         |                |            |         |             | NI     |         |          |       |                |
| insect    | Red-Tailed Leafhopper        | <i>Aflexia rubranura</i>          |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect    | Artesian Agapetus Caddisfly  | <i>Agapetus artesus</i>           |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| insect    | Bell's Roadside-Skipper      | <i>Amblyscirtes belli</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | A Mayfly                     | <i>Ameletus browni</i>            |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| insect    | A Mayfly                     | <i>Ameletus tertius</i>           |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| insect    | Comet Darner                 | <i>Anax longipes</i>              |           |                     |          | NI                              |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | Michigan Bog Grasshopper     | <i>Appalachia arcana</i>          |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| insect    | Black Medusa Cave springtail | <i>Arrhopalites ater</i>          |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | Carolyn's Cave Springtail    | <i>Arrhopalites carolynae</i>     |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | Lewis' Cave springtail       | <i>Arrhopalites lewisi</i>        |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | A cave springtail            | <i>Arrhopalites pavo</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect    | Dusted Skipper               | <i>Atrytonopsis hianna</i>        |           |                     |          |                                 |          | NI      | NI             |            |         |             |        |         |          |       |                |
| insect    | Krekeler's Cave Ant Beetle   | <i>Batrisodes krekeleri</i>       |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | White Mountain Fritillary    | <i>Boloria chariclea montinus</i> |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| insect    | yellow-banded bumblebee      | <i>Bombus terricola</i>           |           |                     | MIH      | NI                              |          |         |                |            |         |             | NI     |         |          |       | NI             |
| insect    | Boreal Fan Moth              | <i>Brachionycha borealis</i>      |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect    | piglet bug                   | <i>Bruchomorpha dorsata</i>       |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | a planthopper                | <i>Bruchomorpha pallidipes</i>    |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect    | Northern Metalmark           | <i>Calephelis borealis</i>        |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          | NI    |                |
| insect    | Swamp Metalmark              | <i>Calephelis muticum</i>         |           |                     |          |                                 |          | NI      |                | MIH        |         |             |        |         |          |       |                |
| insect    | Henry's Elfin                | <i>Callophrys henrici</i>         |           | NI                  |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect    | Frosted Elfin                | <i>Callophrys irus</i>            |           |                     |          |                                 |          |         | NI             |            |         | NI          |        |         |          |       |                |

| Category | Common name                        | scientific name                            | Allegheny | Chequamagon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|------------------------------------|--|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| insect   | Dejected Underwing                 | <i>Catocala dejecta</i>                    |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Headwaters Chilostigman Caddisfly  | <i>Chilostigma itascae</i>                 |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| insect   | a leafhopper                       | <i>Chlorotettix distinctus</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | a leafhopper                       | <i>Chlorotettix nudatus</i>                |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Appalachian Tiger Beetle           | <i>Cicindela ancocisconensis</i>           |           |                     |          | NI                              |          |         |                |            |         | NI          |        |         |          |       | NI             |
| insect   | Northern Barrens Tiger Beetle      | <i>Cicindela patruela</i>                  |           |                     |          |                                 |          |         |                |            |         | NI          | NI     |         |          |       |                |
| insect   | Cow Path Tiger Beetle              | <i>Cicindela purpurea</i>                  |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Arrowhead Spiketail                | <i>Cordulegaster obliqua</i>               |           |                     |          | NI                              |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | yellow-headed lichen moth          | <i>Crambidia cephalica</i>                 |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | unexpected Tiger Moth              | <i>Cyrcia inopinatus</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | gemmed satyr                       | <i>Cylopsis gemma</i>                      |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | monarch                            | <i>Danaus plexippus</i>                    | NI        | NI                  | MIIH     | NI                              | NI       | NI      | NI             | MIIH       | NI      | NI          | NI     | NI      | MIIH     | NI    | NI             |
| insect   | A Mayfly                           | <i>Dannella lita</i>                       |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | A Leafhopper                       | <i>Deltocephalus gnarum</i>                |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | A Noctuid Moth                     | <i>Dichagyris (=Mesembagrotis) reliqua</i> |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | Three-lined Angle Moth             | <i>Digrammia eremiata</i>                  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Kansas Preacher Leafhopper         | <i>Dorydiella kansana</i>                  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Taiga Alpine                       | <i>Erebia mancinus</i>                     |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| insect   | Velvet-striped Grasshopper         | <i>Eritettix simplex</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Early Hairstreak                   | <i>Erora laeta</i>                         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Columbine Duskywing                | <i>Erynnis lucilius</i>                    |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Mottled Duskywing                  | <i>Erynnis martialis</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Persius Duskywing                  | <i>Erynnis persius</i>                     |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| insect   | A Geometrid Moth                   | <i>Euchlaena milnei</i>                    |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | A Moth                             | <i>Eucosma bipunctella</i>                 |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | a moth                             | <i>Eucosma rusticana</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Robertson's Flightless Planthopper | <i>Fitchiella robertsonii</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Leafhopper                       | <i>Flexamia reflexus</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | wet sand savannah moth             | <i>Gabara subnivosella</i>                 |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | a caddisfly                        | <i>Goera stylata</i>                       |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIIH     |       |                |
| insect   | Mustached Clubtail                 | <i>Gomphus adelphus</i>                    | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Harpoon Clubtail                   | <i>Gomphus descriptus</i>                  | NI        |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Rapids Clubtail                    | <i>Gomphus quadricolor</i>                 | NI        |                     |          |                                 |          |         |                |            |         | NI          | NI     |         |          | NI    |                |
| insect   | Sable Clubtail                     | <i>Gomphus rogersi</i>                     | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Green-faced Clubtail               | <i>Gomphus viridifrons</i>                 | NI        | NI                  |          |                                 | NI       |         |                |            |         | NI          | NI     |         |          | NI    |                |
| insect   | A Noctuid Moth                     | <i>Hadena ectypa</i>                       |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |

| Category | Common name                             | scientific name                  | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|---|----------------------------------|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| insect   | Uhler's Sundragon                       | <i>Helocordulia uhleri</i>       |           |                     |          |                                 |          |         |                |            |         |             |        |         |          | NI    |                |
| insect   | Cobweb Skipper                          | <i>Hesperia metea</i>            |           |                     |          |                                 |          | NI      |                |            |         | NI          |        |         |          |       |                |
| insect   | Ottoe skipper                           | <i>Hesperia ottoe</i>            |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| insect   | pink prominent                          | <i>Hyparpax aurora</i>           |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Southern Pygmy Clubtail                 | <i>Lanthus vernalis</i>          |           |                     |          | NI                              |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Hill-prairie Spittlebug                 | <i>Lepyronia gibbosa</i>         |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| insect   | Eyed Brown                              | <i>Lethe eurydice</i>            | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | A Moth                                  | <i>Leucania extincta</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Bronze Copper                           | <i>Lycaena hyllus</i>            |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | A Heptageniid Mayfly                    | <i>Maccaffertium bednariki</i>   |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| insect   | A Leafhopper                            | <i>Macrosteles potorius</i>      |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | Blatchley's walking stick               | <i>Manomera blatchleyi</i>       |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Little Brown Cicada                     | <i>Melampsalta calliope</i>      |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Spur-throat Grasshopper               | <i>Melanoplus morsei</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Newman's brocade                        | <i>Meropleon ambifusca</i>       |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Helianthus Leafhopper                   | <i>Mesamia stramineus</i>        |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Crepitating Conehead katydid            | <i>Neoconocephalus robustus</i>  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Contorted Ochrotrichian Micro Caddisfly | <i>Ochrotrichia contorta</i>     |           |                     |          |                                 |          |         |                | MIIIH      |         |             |        |         |          |       |                |
| insect   | Chryxus Arctic                          | <i>Oeneis chryxus</i>            |           | NI                  |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| insect   | White Mountain Butterfly                | <i>Oeneis melissa semidea</i>    |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| insect   | A Noctuid Moth                          | <i>Oncocnemis saundersiana</i>   |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | a springtail                            | <i>Onychiurus casus</i>          |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Extra-striped Snaketail                 | <i>Ophiogomphus anomalus</i>     |           | NI                  |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Pygmy Snaketail                         | <i>Ophiogomphus howei</i>        |           | NI                  |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| insect   | Maine Snaketail                         | <i>Ophiogomphus mainensis</i>    | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Westfall's Snaketail                    | <i>Ophiogomphus westfalli</i>    |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| insect   | Yellow Stoneroot Borer                  | <i>Papaipema astuta</i>          |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Blazing Star Stem Borer                 | <i>Papaipema beeriana</i>        |           |                     |          |                                 |          | NI      |                |            | NI      |             |        |         |          |       |                |
| insect   | Rattlesnake-master Borer Moth           | <i>Papaipema eryngii</i>         |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | Culvers Root Borer                      | <i>Papaipema sciata</i>          |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| insect   | a leafhopper                            | <i>Para phlepsius particolor</i> |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Leafhopper                            | <i>Paraphlepsius solidaginis</i> |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | stinging rose caterpillar moth          | <i>Parasa indetermina</i>        |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |



| Category | Common name                     | scientific name                         | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|---------------------------------|---|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| insect   | Tawny Crescent                  | <i>Phyciodes batesii</i>                |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| insect   | a planthopper                   | <i>Phylloscelis pallescens</i>          |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | West Virginia White             | <i>Pieris virginensis</i>               | NI        | NI                  |          | NI                              | NI       | NI      |                |            |         | NI          | NI     |         |          |       |                |
| insect   | a planthopper                   | <i>Pissinotus brunneus</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Nabokov's Blue                  | <i>Plebejus idas nabokovi</i>           |           | NI                  |          |                                 | NI       |         |                |            |         |             | NI     |         | MIH      |       |                |
| insect   | White-streaked Looper Moth      | <i>Plusia venusta</i>                   |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | Short-winged Polyamia           | <i>Polyamia brevipennis</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Leafhopper                    | <i>Polyamia brevipennis</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | prairie bunchgrass leafhopper   | <i>Polyamia herbida</i>                 |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Smyth's green comma             | <i>Polygonia faunus smythi</i>          |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Kansas prairie leafhopper       | <i>Prairiana kansana</i>                |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Greenbrier Cave Beetle          | <i>Pseudanophthalmus fuscus</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Timber Ridge Cave Beetle        | <i>Pseudanophthalmus hadenoecus</i>     |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Martha's Cave Beetle            | <i>Pseudanophthalmus hypertrichosis</i> |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Dry Fork Valley Cave Beetle     | <i>Pseudanophthalmus montanus</i>       |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Patton Cave ground beetle       | <i>Pseudanophthalmus sp. 33</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Marengo Cave Ground Beetle      | <i>Pseudanophthalmus striticollis</i>   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Young's Cave Ground Beetle      | <i>Pseudanophthalmus youngi</i>         |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Gandy Creek Cave Springtail     | <i>Pseudosinella certa</i>              |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | A Springtail                    | <i>Pseudosinella espana</i>             |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| insect   | A Cave Springtail               | <i>Pseudosinella fonsa</i>              |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Springtail                    | <i>Pseudosinella gisini</i>             |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | southern purple mint moth       | <i>Pyrausta laticlavata</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Freija's Grizzled Skipper       | <i>Pyrgus centaureae freija</i>         |           |                     |          |                                 |          |         |                |            |         |             |        |         | MIH      |       |                |
| insect   | Grizzled Skipper                | <i>Pyrgus wyandot</i>                   |           |                     |          |                                 |          |         | NI             |            |         | NI          |        |         |          | NI    |                |
| insect   | a planthopper                   | <i>Rhynchomitra recurve</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | colorful nymph                  | <i>Scaphoideus productus</i>            |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Jaguar Flower Moth              | <i>Schinia jaguarina</i>                |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | A Springtail                    | <i>Sinella agna</i>                     |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Wingless Winged Cave Springtail | <i>Sinella alata</i>                    |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Cavernicolous Springtail        | <i>Sinella cavernarum</i>               |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| insect   | Quebec Emerald                  | <i>Somatochlora brevicincta</i>         |           |                     |          |                                 |          |         |                |            |         |             |        |         | NI       |       |                |
| insect   | Ski-tipped Emerald              | <i>Somatochlora elongata</i>            | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Forcipate Emerald               | <i>Somatochlora forcipata</i>           |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |

| Category | Common name                            | scientific name                            | Allegheny | Chequamegon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|--|--|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| insect   | Incurvate Emerald                      | <i>Somatochlora incurvata</i>              |           |                     |          |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| insect   | Mocha Emerald                          | <i>Somatochlora linearis</i>               | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | Ozark emerald                          | <i>Somatochlora ozarkensis</i>             |           |                     |          |                                 |          |         |                | NI         |         |             |        |         |          |       |                |
| insect   | Diana Fritillary                       | <i>Speyeria diana</i>                      |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| insect   | Clemen's Sphinx                        | <i>Sphinx luscitiosa</i>                   |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| insect   | elusive clubtail                       | <i>Stylurus notatus</i>                    |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| insect   | Zebra Clubtail                         | <i>Stylurus scudderi</i>                   | NI        |                     |          |                                 |          |         |                |            |         |             |        |         |          |       |                |
| insect   | A Leafhopper                           | <i>Texananus longipennis</i>               |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| insect   | Lake Huron Locust                      | <i>Trimerotropis huroniana</i>             |           |                     |          |                                 | NI       |         | NI             |            |         |             |        |         |          |       |                |
| insect   | Ebony Boghaunter                       | <i>Williamsonia fletcheri</i>              |           |                     |          |                                 | NI       |         |                |            |         |             |        |         | NI       |       |                |
| insect   | Ringed Boghaunter                      | <i>Williamsonia lintneri</i>               |           |                     |          |                                 | NI       |         |                |            |         |             |        |         |          |       |                |
| mammal   | moose                                  | <i>Alces americanus</i>                    |           |                     |          |                                 |          |         |                |            |         |             |        |         | NI       |       |                |
| mammal   | gray wolf                              | <i>Canis lupis</i>                         |           | NI                  | NI       |                                 | NI       |         |                |            |         |             | NI     |         | NI       |       |                |
| mammal   | big brown bat                          | <i>Eptesicus fuscus</i>                    |           | NI                  |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| mammal   | Northern Flying Squirrel               | <i>Glaucomys sabrinus</i>                  | NI        |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| mammal   | West Virginia northern flying squirrel | <i>Glaucomys sabrinus fuscus</i>           |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | American Marten                        | <i>Martes americana</i>                    |           | NI                  |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| mammal   | Southern Rock Vole                     | <i>Microtus chrotorrhinus carolinensis</i> |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | Southeastern Myotis                    | <i>Myotis austroriparius</i>               |           |                     |          |                                 |          |         |                |            |         |             | NI     |         |          |       |                |
| mammal   | Eastern Small-footed Myotis            | <i>Myotis leibii</i>                       |           |                     |          | NI                              |          |         |                | MIH        |         | NI          |        | NI      |          |       | NI             |
| mammal   | Little Brown Myotis                    | <i>Myotis lucifugus</i>                    | NI        | NI                  | MIH      | NI                              | NI       | NI      | NI             | MIH        |         | NI          | NI     | NI      | MIH      | NI    | NI             |
| mammal   | Allegheny Woodrat                      | <i>Neotoma magister</i>                    |           |                     |          |                                 |          | NI      |                |            |         | NI          |        |         |          |       |                |
| mammal   | Evening Bat                            | <i>Nycticeius humeralis</i>                |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| mammal   | Tri-colored Bat                        | <i>Perimyotis subflavus</i>                | NI        | NI                  |          | NI                              |          | NI      | NI             | MIH        |         | NI          | NI     | NI      | MIH      | NI    | NI             |
| mammal   | Eastern Heather Vole                   | <i>Phenacomys ungava</i>                   |           |                     |          |                                 |          |         |                |            |         |             |        |         | NI       |       |                |
| mammal   | Long-tailed Shrew                      | <i>Sorex dispar</i>                        |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | Southern Water Shrew                   | <i>Sorex palustris punctulatus</i>         |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | Franklin's Ground Squirrel             | <i>Spermophilus franklinii</i>             |           |                     |          |                                 |          |         |                |            | NI      |             |        |         |          |       |                |
| mammal   | Eastern Spotted Skunk                  | <i>Spilogale putorius</i>                  |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | plains spotted skunk                   | <i>Spilogale putorius interrupta</i>       |           |                     |          |                                 |          |         |                | MIH        |         |             |        |         |          |       |                |
| mammal   | Appalachian cottontail                 | <i>Sylvilagus obscurus</i>                 |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| mammal   | Northern Bog Lemming                   | <i>Synaptomys borealis</i>                 |           |                     | NI       |                                 |          |         |                |            |         |             |        |         |          |       | NI             |
| mammal   | Southern Bog Lemming                   | <i>Synaptomys cooperi</i>                  |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| myriapod | Bollman's Cave Millipede               | <i>Conotyla bollmani</i>                   |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| myriapod | A Millipede                            | <i>Ergodesmus remingtoni</i>               |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| myriapod | A Cave Obligate Millipede              | <i>Pseudotremia indianae</i>               |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| myriapod | Germany Valley Cave Millipede          | <i>Pseudotremia lusciosa</i>               |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| myriapod | South Branch Valley Cave Millipede     | <i>Pseudotremia princeps</i>               |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| myriapod | Reynolds Cave Millipede                | <i>Pseudotremia reynoldsae</i>             |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |

| Category | Common name                        | scientific name                              | Allegheny | Chequamagon-Nicolet | Chippewa | Green Mountain and Finger Lakes | Hiawatha | Hoosier | Huron-Manistee | Mark Twain | Midewin | Monongahela | Ottawa | Shawnee | Superior | Wayne | White Mountain |
|----------|------------------------------------|--|-----------|---------------------|----------|---------------------------------|----------|---------|----------------|------------|---------|-------------|--------|---------|----------|-------|----------------|
| myriapod | A Cave Obligate Millipede          | <i>Pseudotremia salisae</i>                  |           |                     |          |                                 |          | NI      |                |            |         |             |        |         |          |       |                |
| myriapod | Grand Caverns Blind Cave Millipede | <i>Trichopetalum (Zygonopus) weyeriensis</i> |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| myriapod | Luray Caverns Blind Cave Millipede | <i>Trichopetalum (Zygonopus) whitei</i>      |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| myriapod | West Virginia blind cave millipede | <i>Trichopetalum krekeleri</i>               |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |
| reptile  | Spotted Turtle                     | <i>Clemmys guttata</i>                       |           |                     |          | NI                              |          |         | NI             |            |         |             |        |         |          |       |                |
| reptile  | Kirtland's Snake                   | <i>Clonophis kirtlandii</i>                  |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| reptile  | Timber Rattlesnake                 | <i>Crotalus horridus</i>                     | NI        |                     |          |                                 |          | NI      |                | MIIH       |         | NI          |        | NI      |          | NI    |                |
| reptile  | Blanding's Turtle                  | <i>Emydoidea blandingii</i>                  |           |                     | MIIH     |                                 | NI       |         | NI             |            | NI      |             |        |         |          |       |                |
| reptile  | Wood Turtle                        | <i>Glyptemys insculpta</i>                   | NI        | NI                  |          | NI                              | NI       |         | NI             |            |         | NI          | NI     |         | MIIH     |       | NI             |
| reptile  | Alligator Snapping Turtle          | <i>Macrochelys temminckii</i>                |           |                     |          |                                 |          |         |                | MIIH       |         |             |        | NI      |          |       |                |
| reptile  | Mississippi Green Watersnake       | <i>Nerodia cyclopion</i>                     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| reptile  | Flat-headed Snake                  | <i>Tantilla gracilis</i>                     |           |                     |          |                                 |          |         |                |            |         |             |        | NI      |          |       |                |
| reptile  | Eastern Box Turtle                 | <i>Terrapene carolina carolina</i>           |           |                     |          |                                 |          |         | NI             |            |         |             |        |         |          |       |                |
| reptile  | mountain earth snake               | <i>Virginia valeriae pulchra</i>             |           |                     |          |                                 |          |         |                |            |         | NI          |        |         |          |       |                |

VERSION  
7/6/2023

| Category         | Common name                  | scientific name                               | Tongass |
|------------------|------------------------------|---|---------|
| plant - vascular | Eschsoltz's little nightmare | <i>Aphragmus eschsoltzianus</i>               | NI      |
| plant - vascular | Moosewort fern               | <i>Botrychium tunux</i>                       | NI      |
| plant - vascular | Spatulate moonwort fern      | <i>Botrychium spathulatum</i>                 | NI      |
| plant - vascular | Moonwort, no common name     | <i>Botrychium yaaxudakeit</i>                 | NI      |
| plant - vascular | Edible thistle               | <i>Cirsium edule var. macounii</i>            | NI      |
| plant - vascular | Mountain lady's slipper      | <i>Cypripedium montanum</i>                   | NI      |
| plant - vascular | Large yellow lady's slipper  | <i>Cypripedium parviflorum var. pubescens</i> | NI      |
| plant - vascular | Calder's loveage             | <i>Ligusticum calderi</i>                     | NI      |
| plant - vascular | Pale poppy                   | <i>Papaver alboroseum</i>                     | NI      |
| plant - vascular | Alaska rein orchid           | <i>Piperia unalascensis</i>                   | NI      |
| plant - vascular | Lesser round-leaved orchid   | <i>Platanthera orbiculata</i>                 | NI      |
| plant - vascular | Kruckeberg's swordfern       | <i>Polystichum kruckebergii</i>               | NI      |
| plant - vascular | Unalaska mist-maid           | <i>Romanzoffia unalascensis</i>               | NI      |
| plant - vascular | Henderson's checkermallow    | <i>Sidalcea hendersonii</i>                   | NI      |
| plant - vascular | Dune tansy                   | <i>Tanacetum bipinnatum subsp. huronense</i>  | NI      |
| fungi            | Lichen, no common name       | <i>Lobaria amplissima</i>                     | NI      |
| bird             | Queen Charlotte goshawk      | <i>Accipiter gentilis laingi</i>              | NI      |
| bird             | Kittlitz's Murrelet          | <i>Brachyramphus brevirostris</i>             | NI      |
| bird             | Black oystercatcher          | <i>Haematopus bachmani</i>                    | NI      |
| bird             | Aleutian Tern                | <i>Sterna aleutica</i>                        | NI      |

VERSION 7/6/2023