

# Attachment A - Standard Operating Procedures and Mitigation Measures from the PEIS

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## Introduction

The following Standard Operating Procedures and Mitigation Measures have been adopted from the Record of Decision for the PEIS. Minor edits have been made to some Standard Operating Procedures and Mitigation Measures to clarify intent.

Standard Operating Procedures (identified below with SOP) have been identified to reduce adverse effects to environmental and human resources from vegetation treatment activities based on guidance in BLM manuals and handbooks, regulations, and standard BLM and industry practices.<sup>1</sup> The list is not all encompassing, but is designed to give an overview of practices that would be considered when designing and implementing a vegetation treatment project on public lands (PER:2-29)<sup>2</sup>. Effects described in the EIS are predicated on application of the Standard Operating Procedures, that a site-specific determination is made that their application is unnecessary to achieve their intended purpose or protection, or that if the parent handbook or policy direction evolves, the new direction would continue to provide the appropriate environmental protections.

For example, the Standard Operating Procedure to “complete vegetation treatments seasonally before pollinator foraging plants bloom” would not be applied to treatments not likely to have a significant effect on pollinators.

PEIS Mitigation Measures (identified below with MM) were identified for all potential adverse effects identified in the PEIS. They are included in, and adopted by, the Record of Decision for the PEIS. Like the SOPs, application of the mitigation measures is assumed in this EIS. However, for PEIS Mitigation Measures, site-specific analysis and/or the use of Individual Risk Assessments Tools (see Chapter 3), or evolution of the PEIS Mitigation Measures into handbook direction at the national level, would be permitted to identify alternative ways to achieve the expected protections (PEIS:4-4).

Although not displayed here, Standard Operating Procedures for non-herbicide treatments (from regulation, BLM policy, and BLM Handbook direction) also apply (PER:2-31 to 44).

## Standard Operating Procedures and Mitigation Measures for Applying Herbicides

### Guidance Documents

BLM Handbook H-9011-1 (*Chemical Pest Control*); and manuals 1112 (*Safety*), 9011 (*Chemical Pest Control*), 9012 (*Expenditure of Rangeland Insect Pest Control Funds*), 9015 (*Integrated Weed Management*), and 9220 (*Integrated Pest Management*).

### General

- Prepare an operational and spill contingency plan in advance of treatment. (*SOP*)
- Conduct a pretreatment survey before applying herbicides. (*SOP*)

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<sup>1</sup> Manual-directed standard operating procedures and other standing direction may be referred to as best management practices in resource management and other plans, particularly when they apply to water.

<sup>2</sup> The PER includes Standard Operating Procedures for the full range of vegetation treatment methods. Only those applicable to herbicide application are included in this appendix.

- Select the herbicide that is least damaging to the environment while providing the desired results. *(SOP)*
- Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, other ingredients, and tank mixtures. *(SOP)*
- Apply the least amount of herbicide needed to achieve the desired result. *(SOP)*
- Follow herbicide product label for use and storage. *(SOP)*
- Have licensed or certified applicators or State-licensed “trainees” apply herbicides, or they can be applied by BLM employees under the direct supervision of a BLM-certified applicator. *(SOP)*
- Use only USEPA-approved herbicides and follow product label directions and “advisory” statements. *(SOP)*
- Review, understand, and conform to the “Environmental Hazards” section on the herbicide product label. This section warns of known herbicide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. *(SOP)*
- Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. *(SOP)*
- Minimize the size of application area, when feasible. *(SOP)*
- Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners. *(SOP)*
- Post treated areas and specify reentry or rest times, if appropriate. *(SOP)*
- Notify adjacent landowners prior to treatment, if appropriate. *(SOP)*
- Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at <http://www.cdms.net/>. *(SOP)*
- Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. *(SOP)*
- Avoid accidental direct spray and spill conditions to minimize risks to resources. *(SOP)*
- Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). *(SOP)*
- Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. *(SOP)*
- Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent. *(SOP)*
- Use drift control agents and low volatile formulations. *(SOP)*
- Conduct pre-treatment surveys for sensitive habitat and Special Status species within or adjacent to proposed treatment areas. *(SOP)*
- Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. *(SOP)*
- Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. *(SOP)*
- Turn off application equipment at the completion of spray runs and during turns to start another spray run. *(SOP)*
- Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. *(SOP)*
- Clean OHVs to remove plant material. *(SOP)*

The BLM has suspended the use of the adjuvant R-11.

### Air Quality

See Manual 7000 (*Soil, Water, and Air Management*)

- Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. (SOP)
- Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (>6 mph for aerial applications) or rainfall is imminent. (SOP)
- Use drift reduction agents, as appropriate, to reduce the drift hazard. (SOP)
- Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). (SOP)
- Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources). (SOP)

### Soil

See Manual 7000 (*Soil, Water, and Air Management*)

- Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. (SOP)
- Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. (SOP)
- Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas. (SOP)

### Water Resources

See Manual 7000 (*Soil, Water, and Air Management*)

- Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. (SOP)
- Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. (SOP)
- Use local historical weather data to choose the month of treatment. (SOP)
- Considering the phenology of target aquatic species, schedule treatments based on the condition of the water body and existing water quality conditions. (SOP)
- Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. (SOP)
- Review hydrogeologic maps of proposed treatment areas. Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. Minimize treating areas with high risk for groundwater contamination. (SOP)
- Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. (SOP)
- Do not rinse spray tanks in or near water bodies. (SOP)
- Do not broadcast pellets where there is danger of contaminating water supplies. (SOP)
- Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment. (SOP)

- Establish appropriate (herbicide-specific) buffer zones for species/populations (Tables A2-1 and A2-2). (MM)
- Areas with potential for groundwater for domestic or municipal use shall be evaluated through the appropriate, validated model(s) to estimate vulnerability to potential groundwater contamination, and appropriate mitigation measures shall be developed if such an area requires the application of herbicides and cannot otherwise be treated with non-herbicide methods. (MM)
- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths from water of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications. (SOP)
- Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide and site-specific conditions to minimize impacts to water bodies. (SOP)

### Wetlands and Riparian Areas

- Use a selective herbicide and a wick or backpack sprayer. (SOP)
- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths from water of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications. (SOP)
- See mitigation for Water Resources and Vegetation. (MM)

### Vegetation

See Handbook H-4410-1 (*National Range Handbook*), and manuals 5000 (*Forest Management*) and 9015 (*Integrated Weed Management*)

- Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. (SOP)
- Use native or sterile plants for revegetation and restoration projects to compete with invasive plants until desired vegetation establishes. (SOP)
- Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. (SOP)
- Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, to maintain desirable vegetation on the treatment site. (SOP)
- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and sulfometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants are identified. (MM)
- Establish appropriate (herbicide-specific) buffer zones (Tables A2-1 and 2) around downstream water bodies, habitats, and species/populations of interest. Consult the ecological risk assessments (ERAs) prepared for the PEIS for more specific information on appropriate buffer distances under different soil, moisture, vegetation, and application scenarios. (MM)
- Limit the aerial application of chlorsulfuron and metsulfuron methyl to areas with difficult land access, where no other means of application are possible. (MM)
- Do not apply sulfometuron methyl aerially. (MM)
- When necessary to protect Special Status plant species, implement all conservation measures for plants presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (see Appendix 5). (MM)

### Pollinators

- Complete vegetation treatments seasonally before pollinator foraging plants bloom. (SOP)
- Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. (SOP)
- Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment. (SOP)
- Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. (SOP)
- Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. (SOP)
- Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. (SOP)
- Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants and in their habitats. (SOP)

### Fish and Other Aquatic Organisms

See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)

- Use appropriate buffer zones based on label and risk assessment guidance. (SOP)
- Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. (SOP)
- Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. (SOP)
- For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to meet vegetation management objectives, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label. (SOP)
- Limit the use of diquat in water bodies that have native fish and aquatic resources. (MM)
- Limit the use of terrestrial herbicides (especially diuron) in watersheds with characteristics suitable for potential surface runoff that have fish-bearing streams during periods when fish are in life stages most sensitive to the herbicide(s) used. (MM)
- When necessary to protect Special Status fish and other aquatic organisms, implement all conservation measures for aquatic animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (see Appendix 5). (MM)
- Establish appropriate herbicide-specific buffer zones for water bodies, habitats, or fish or other aquatic species of interest (Tables A2-3 and A2-4, and recommendations in individual ERAs). (MM)
- Consider the proximity of application areas to salmonid habitat and the possible effects of herbicides on riparian and aquatic vegetation. Maintain appropriate buffer zones around salmonid-bearing streams. (MM)
- At the local level, consider effects to Special Status fish and other aquatic organisms when designing treatment programs. (MM)

### Wildlife

See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)

- Use herbicides of low toxicity to wildlife, where feasible. (SOP)

- Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. *(SOP)*
- Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife. *(SOP)*
- To minimize risks to terrestrial wildlife, do not exceed the typical application rate for applications of dicamba, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr, where feasible. *(MM)*
- Minimize the size of application areas, where practical, when applying 2,4-D, bromacil, diuron, and Overdrive® to limit impacts to wildlife, particularly through contamination of food items. *(MM)*
- Where practical, limit glyphosate and hexazinone to spot applications in grazing land and wildlife habitat areas to avoid contamination of wildlife food items. *(MM)*
- Do not use the adjuvant R-11 *(MM)*
- Either avoid using glyphosate formulations containing POEA, or seek to use formulations with the least amount of POEA, to reduce risks to amphibians. *(MM)*
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones (Tables A2-1 and 2) to limit contamination of off-site vegetation, which may serve as forage for wildlife. *(MM)*
- Do not aerially apply diquat directly to wetlands or riparian areas. *(MM)*
- When necessary to protect Special Status wildlife species, implement conservation measures for terrestrial animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (See Appendix 5) *(MM)*

#### Threatened, Endangered, and Sensitive Species

See Manual 6840 (*Special Status Species*)

- Provide clearances for Special Status species before treating an area as required by Special Status Species Program policy. Consider effects to Special Status species when designing herbicide treatment programs. *(SOP)*
- Use a selective herbicide and a wick or backpack sprayer to minimize risks to Special Status plants. *(SOP)*
- Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for Special Status species in area to be treated. *(SOP)*

#### Livestock

See Handbook H-4120-1 (*Grazing Management*)

- Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible. *(SOP)*
- As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable. *(SOP)*
- Use herbicides of low toxicity to livestock, where feasible. *(SOP)*
- Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. *(SOP)*
- Avoid use of diquat in riparian pasture while pasture is being used by livestock. *(SOP)*
- Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. *(SOP)*
- Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. *(SOP)*
- Provide alternative forage sites for livestock, if possible. *(SOP)*

- Minimize potential risks to livestock by applying diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr at the typical application rate where feasible. (MM)
- Do not apply 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, or triclopyr across large application areas, where feasible, to limit impacts to livestock, particularly through contamination of food items. (MM)
- Where feasible, limit glyphosate and hexazinone to spot applications in rangeland. (MM)
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones (Tables A2-1 and 2) to limit contamination of off-site vegetation, which may serve as forage for wildlife. (MM)

### Wild Horses and Burros

- Minimize using herbicides in areas grazed by wild horses and burros. (SOP)
- Use herbicides of low toxicity to wild horses and burros, where feasible. (SOP)
- Remove wild horses and burros from identified treatment areas prior to herbicide application, in accordance with herbicide product label directions for livestock. (SOP)
- Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources. (SOP)
- Minimize potential risks to wild horses and burros by applying diuron, glyphosate, hexazinone, tebuthiuron, and triclopyr at the typical application rate, where feasible, in areas associated with wild horse and burro use. (MM)
- Consider the size of the application area when making applications of 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, and triclopyr in order to reduce potential impacts to wild horses and burros. (MM)
- Apply herbicide label grazing restrictions for livestock to herbicide treatment areas that support populations of wild horses and burros. (MM)
- Where practical, limit glyphosate and hexazinone to spot applications in rangeland. (MM)
- Do not apply bromacil or diuron in grazing lands within herd management areas (HMAs), and use appropriate buffer zones identified in Tables A2-1 and 2 to limit contamination of vegetation in off-site foraging areas. (MM)
- Do not apply 2,4-D, bromacil, or diuron in HMAs during the peak foaling season (March through June, and especially in May and June), and do not exceed the typical application rate of Overdrive® or hexazinone in HMAs during the peak foaling season in areas where foaling is known to take place. (MM)

### Cultural Resources and Paleontological Resources

See handbooks H-8120-1 (*Guidelines for Conducting Tribal Consultation*) and H- 8270-1 (*General Procedural Guidance for Paleontological Resource Management*), and manuals 8100 (*The Foundations for Managing Cultural Resources*), 8120 (*Tribal Consultation Under Cultural Resource Authorities*), and 8270 (*Paleontological Resource Management*). See also: *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act*.

- Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act* and State protocols or 36 Code of Federal Regulations Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes. (SOP)

- Follow BLM Handbook H-8270-1 (*General Procedural Guidance for Paleontological Resource Management*) to determine known Condition I and Condition 2 paleontological areas, or collect information through inventory to establish Condition 1 and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts. (SOP)
- Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments; work with tribes to minimize impacts to these resources. (SOP)
- Follow guidance under Human Health and Safety in the PEIS in areas that may be visited by Native peoples after treatments. (SOP)
- Do not exceed the typical application rate when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr in known traditional use areas. (MM)
- Avoid applying bromacil or tebuthiuron aerially in known traditional use areas. (MM)
- Limit diquat applications to areas away from high residential and traditional use areas to reduce risks to Native Americans. (MM)

#### Visual Resources

See handbooks H-8410-1 (*Visual Resource Inventory*) and H-8431-1 (*Visual Resource Contrast Rating*), and manual 8400 (*Visual Resource Management*)

- Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. (SOP)
- Consider the surrounding land use before assigning aerial spraying as an application method. (SOP)
- Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area. (SOP)
- If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II). (SOP)
- Lessen visual impacts by: 1) designing projects to blend in with topographic forms; 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects; and 3) revegetating the site following treatment. (SOP)
- When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives. (SOP)

#### Wilderness and Other Special Areas

See handbooks H-8550-1 (*Management of Wilderness Study Areas (WSAs)*), and H-8560-1 (*Management of Designated Wilderness Study Areas*), and Manual 8351 (*Wild and Scenic Rivers*)

- Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area, and to bring only weed-free hay and straw onto BLM lands. (SOP)
- Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. (SOP)
- Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. (SOP)

- Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. (SOP)
- Use the “minimum tool” to treat noxious weeds and other invasive plants, relying primarily on the use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock. (SOP)
- Use herbicides only when they are the minimum treatment method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. (SOP)
- Give preference to herbicides that have the least impact on non-target species and the wilderness environment. (SOP)
- Implement herbicide treatments during periods of low human use, where feasible. (SOP)
- Address wilderness and special areas in management plans. (SOP)
- Control of weed infestations shall be carried out in a manner compatible with the intent of Wild and Scenic River management objectives. (SOP)
- Mitigation measures that may apply to wilderness and other special area resources are associated with human and ecological health and recreation (see mitigation measures for Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, Recreation, and Human Health and Safety). (MM)

#### Recreation

See Handbook H-1601-1 (*Land Use Planning Handbook, Appendix C*)

- Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. (SOP)
- Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. (SOP)
- Adhere to entry restrictions identified on the herbicide product label for public and worker access. (SOP)
- Post signs noting exclusion areas and the duration of exclusion, if necessary. (SOP)
- Mitigation measures that may apply to recreational resources are associated with human and ecological health (see mitigation measures for Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, and Human Health and Safety). (MM)

#### Social and Economic Values

- Consider surrounding land use before selecting aerial spraying as a treatment method, and avoid aerial spraying near agricultural or densely-populated areas. (SOP)
- Post treated areas and specify reentry or rest times, if appropriate. (SOP)
- Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per herbicide product label instructions. (SOP)
- Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. (SOP)
- Control public access until potential treatment hazards no longer exist, per herbicide product label instructions. (SOP)
- Observe restricted entry intervals specified by the herbicide product label. (SOP)
- Notify local emergency personnel of proposed treatments. (SOP)
- Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources. (SOP)
- Consult with Native American tribes to locate any areas of vegetation that are of significance to the tribes and Native groups and that might be affected by herbicide treatments. (SOP)

- To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies for herbicide treatment projects (including the herbicides) through local suppliers. *(SOP)*
- To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an integrated vegetation management program for projects proposing local use of herbicides. *(SOP)*

#### Rights-of-way

- Coordinate vegetation treatment activities where joint or multiple use of a ROW exists. *(SOP)*
- Notify other public land users within or adjacent to the ROW proposed for treatment. *(SOP)*
- Use only herbicides that are approved for use in ROW areas. *(SOP)*

#### Human Health and Safety

- Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. *(SOP)*
- Use protective equipment as directed by the herbicide product label. *(SOP)*
- Post treated areas with appropriate signs at common public access areas. *(SOP)*
- Observe restricted entry intervals specified by the herbicide product label. *(SOP)*
- Provide public notification in newspapers or other media where the potential exists for public exposure. *(SOP)*
- Store herbicides in secure, herbicide-approved storage. *(SOP)*
- Have a copy of MSDSs at work site. *(SOP)*
- Notify local emergency personnel of proposed treatments. *(SOP)*
- Contain and clean up spills and request help as needed. *(SOP)*
- Secure containers during transport. *(SOP)*
- Follow label directions for use and storage. *(SOP)*
- Dispose of unwanted herbicides promptly and correctly. *(SOP)*
- Use the typical application rate, where feasible, when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr to reduce risk to workers and the public. *(MM)*
- Avoid applying bromacil and diuron aerially. Do not apply sulfometuron methyl aerially. *(MM)*
- Limit application of chlorsulfuron via ground broadcast applications at the maximum application rate. *(MM)*
- Limit diquat application to ATV, truck spraying, and boat applications to reduce risks to workers; limit diquat applications to areas away from high residential and subsistence use to reduce risks to the public. *(MM)*
- Evaluate diuron applications on a site-by-site basis to avoid risks to humans. There appear to be few scenarios where diuron can be applied without risk to workers. *(MM)*
- Do not apply hexazinone with an over-the-shoulder broadcast applicator (backpack sprayer). *(MM)*

**TABLE A2-1. BUFFER DISTANCES TO MINIMIZE RISK TO VEGETATION FROM OFF-SITE DRIFT OF BLM-EVALUATED HERBICIDES**

Application Scenario	BROM <sup>1</sup>	CHLR <sup>1</sup>	DIQT <sup>1</sup>	DIUR <sup>1</sup>	FLUR <sup>1</sup>	IMAZ <sup>1</sup>	OVER <sup>1</sup>	SULF <sup>1</sup>	TEBU <sup>1</sup>
<b>Buffer Distance (feet) from Non-target Aquatic Plants</b>									
<b>Typical Application Rate</b>									
Aerial	NA	0	NE	NA	NE	0	NA	1,300	NE
Low Boom <sup>2</sup>	100	0	NE	900	NE	0	100	900	0
High Boom <sup>2</sup>	900	0	NE	1,000	NE	0	900	900	0
<b>Maximum Application Rate</b>									
Aerial	NA	300	NE	NA	NE	300	NA	1,500	NE
Low Boom <sup>2</sup>	900	0	NE	1,000	NE	0	900	900	0
High Boom <sup>2</sup>	900	0	NE	1,000	NE	0	900	900	0
<b>Buffer Distance (feet) from Non-target Terrestrial Plants</b>									
<b>Typical Application Rate</b>									
Aerial	NA	1,350	1,200	NA	NE	0	NA	0	NE
Low Boom <sup>2</sup>	950	900	100	0	NE	0	0	0	0
High Boom <sup>2</sup>	950	900	900	100	NE	0	100	0	0
<b>Maximum Application Rate</b>									
Aerial	NA	1,350	1,200	NA	NE	900	NA	0	NE
Low Boom <sup>2</sup>	1,000	1,000	900	200	NE	0	100	0	50
High Boom <sup>2</sup>	1,000	1,000	900	500	NE	0	100	0	50
<b>Buffer Distance (feet) from Threatened, Endangered, and Sensitive Plants</b>									
<b>Typical Application Rate</b>									
Aerial	NA	1,400	1,200	NA	NE	0	NA	1,500	NE
Low Boom <sup>2</sup>	1,200	1,000	900	1,000	NE	0	100	1,100	0
High Boom <sup>2</sup>	1,200	1,000	900	1,000	NE	0	900	1,000	50
<b>Maximum Application Rate</b>									
Aerial	NA	1,400	1,200	NA	NE	900	NA	1,500	NE
Low Boom <sup>2</sup>	1,200	1,050	1,000	1,000	NE	0	900	1,100	100
High Boom <sup>2</sup>	1,200	1,000	1,000	1,000	NE	0	900	1,000	500

<sup>1</sup> BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULF = Sulfometuron methyl; and TEBU = Tebuthiuron.

<sup>2</sup> High boom is 50 inches above ground and low boom is 20 inches above ground.

NE = Not evaluated and NA = not applicable.

Buffer distances are the smallest modeled distance at which no risk was predicted. In some cases, buffer distances were extrapolated if the largest distance modeled still resulted in risk, or interpolated if greater precision was required.

**TABLE A2-2. BUFFER DISTANCES TO MINIMIZE RISK TO VEGETATION FROM OFF-SITE DRIFT OF FOREST SERVICE-EVALUATED HERBICIDES**

Application Scenario	2,4-D	Dicamba	Clopyralid	Glyphosate	Hexazinone	Imazapyr	Metsulfuron Methyl	Picloram	Triclopyr
<b>Buffer Distance (feet) from Susceptible Plants<sup>1</sup></b>									
<b>Typical Application Rate</b>									
Aerial	NE	>900	900	300	300	900	900	>900	500
Low Boom	NE	300	900	50	NE	900	900	>900	300
<b>Maximum Application Rate</b>									
Aerial	NE	>900	1,000	300	900	>900	>900	>900	>900
Low Boom	NE	900	1,000	300	NE	>900	>900	>900	>900
<b>Buffer Distance (feet) from Tolerant Terrestrial Plants</b>									
<b>Typical Application Rate</b>									
Aerial	NE	0	0	25	NE	100	50	25	NE
Low Boom	NE	0	0	25	0	25	25	25	NE
<b>Maximum Application Rate</b>									
Aerial	NE	0	25	50	NE	300	100	50	NE
Low Boom	NE	0	25	25	100	50	25	25	NE

NE = Not evaluated.

Buffer distances are the smallest modeled distance at which no risk was predicted. In some cases, buffer distances were extrapolated if the largest distance modeled still resulted in risk, or interpolated if greater precision was required.

<sup>1</sup> Mitigation measures for Bureau Sensitive or Federally Listed species use these buffer distances

**TABLE A2-3. BUFFER DISTANCES TO MINIMIZE RISK TO NON-SPECIAL STATUS FISH AND AQUATIC INVERTEBRATES FROM OFF-SITE DRIFT OF BLM-EVALUATED HERBICIDES FROM BROADCAST AND AERIAL TREATMENTS**

Application Scenario	BROM <sup>1</sup>	CHLR	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
<b>Minimum Buffer Distance (feet) from Fish and Aquatic Invertebrates</b>									
<b>Typical Application Rate</b>									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	0	NA	0	0	0	0
High boom	0	0	NA	0	NA	0	0	0	0
<b>Maximum Application Rate</b>									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	100	NA	0	0	0	0
High boom	0	0	NA	100	NA	0	0	0	0

<sup>1</sup> BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.

NA = Not applicable.

Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height.

**TABLE A2-4. BUFFER DISTANCES TO MINIMIZE RISK TO SPECIAL STATUS FISH AND AQUATIC ORGANISMS FROM OFF-SITE DRIFT OF BLM-EVALUATED HERBICIDES FROM BROADCAST AND AERIAL TREATMENTS**

Application Scenario	BROM <sup>1</sup>	CHLR	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
<b>Minimum Buffer Distance (feet) from Fish and Aquatic Invertebrates</b>									
<b>Typical Application Rate</b>									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	0	NA	0	0	0	0
High boom	0	0	NA	100	NA	0	0	0	0
<b>Maximum Application Rate</b>									
Aerial	NA	0	NA	NA	NA	0	NA	0	NA
Low boom	0	0	NA	100	NA	0	0	0	0
High boom	0	0	NA	900	NA	0	0	0	0

<sup>1</sup> BROM = Bromacil; CHLR = Chlorsulfuron; DIQT = Diquat; DIUR = Diuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Diflufenzopyr + Dicamba (Overdrive); SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.

NA = Not applicable.

Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height.

