

## Appendix 4. Implementation Recommendations and Guidelines

Conservation actions and Implementation Recommendations and Guidelines (IRGs) identified in this Action Plan will be implemented in different ways, depending on land ownership.

Implementation of the conservation actions and IRGs on federal lands will be guided by recently revised Bureau of Land Management (BLM) resource management plans (RMPs) (2015) and other regulations specific to federal lands. As such, during the development of this Action Plan, conservation actions and IRGs that are applicable to federal lands were generally aligned with those identified in the BLM's Resource Management Plan Amendment and Final Environmental Impact Statement (hereafter "BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS") for Oregon (2015).

The State has authority to ensure that the conservation actions and IRGs in this Plan are implemented on state-owned lands and by relevant State agencies. This authority is granted through new Oregon Land Conservation and Development Commission (LCDC) and Oregon Department of Fish and Wildlife (ODFW) rules governing development in significant sage-grouse habitat (OARs 660-023-0115 and 635-140-0025, respectively; see Section II), and by the Governor's Executive Order directing all impacted state agencies to implement actions in accordance with the Action Plan. Additionally, lands managed by the Department of State Lands (DSL) have been enrolled in a Candidate Conservation Agreement with Assurances (CCAA), and conservation measures detailed in site-specific plans for these lands must be implemented in accordance with the provisions of the CCAA.

Conservation actions and IRGs related to habitat and land management (other than compensatory mitigation) as well as livestock management are anticipated to be implemented voluntarily by landowners who are enrolled in Candidate Conservation Agreements with Assurances or other federal or state incentive programs designed to reduce the threats to sage-grouse. As such, during the development of this Plan, conservation actions and IRGs applicable to private lands were generally aligned with those identified in the Programmatic CCAA (Harney SCD and USFWS 2014). It is recognized that the State of Oregon has no authority to direct habitat management on private lands. Thus, the State relies upon landowners to voluntarily implement conservation actions through incentive-based programs sponsored by Soil and Water Conservation Districts (SWCDs), the Oregon Watershed Enhancement Board, the Natural Resources Conservation Service (NRCS), and others.

In recognition that many materials and resources are available describing the best scientific approaches to implementing conservation actions, the IRGs here are not intended to be exhaustive. Some of these resources that land managers and practitioners can draw upon are identified in the table below. It is also important to note that sage-grouse habitat characteristics vary across the range of the bird (depending on elevation, soil type, and

moisture, for example), making a one-size-fits-all approach impractical. Thus, the implementation guidelines included in this appendix are not intended to be prescriptive across the entire Sage-Grouse Conservation (SageCon) planning landscape. Rather, they provide general guidelines that are supported by science and should be customized and implemented adaptively according to the site-specific characteristics within project boundaries.

### **Literature Cited**

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Manier, D. J., D. J. A. Wood, Z. H. Bowen, R. M. Donovan, M. J. Holloran, L. M. Juliusson, K. S. Mayne, S. J. Oyler-McCance, F. R. Quamen, D. J. Saher and A. J. Titolo. 2013. Summary of science, activities, programs, and policies that influence the rangewide conservation of greater sage-grouse (*Centrocercus urophasianus*). Open-File Report 2013–1098. U.S. Geological Survey, Reston, Virginia, USA.

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Secretary of the Interior (USDOI). 2015. Rangeland fire prevention, management, and restoration. Implementation Plan: Secretarial Order 3336. U.S. Department of the Interior, Washington, D.C., USA.

Harney Soil and Water Conservation District (Harney SWCD) and U.S. Fish and Wildlife Service (USFWS). 2014. Greater sage-grouse programmatic candidate conservation agreement with assurances for private rangelands in Harney County, Oregon between the Harney Soil and Water Conservation District and the United States Fish and Wildlife Service. Portland, Oregon, USA.

## Implementation Recommendations and Guidelines

Juniper Encroachment (JPR)	
Relevant Action	Implementation Recommendations and Guidelines (IRGs)
<p>Action JPR-3</p> <p>Reduce Phases I and II juniper encroachment (&lt;10% canopy cover) in sage-grouse priority habitats (PACs) and important areas of connectivity in Oregon to a rate greater than or equal to the rate of encroachment.</p>	<p>IRG-JPR-3-1 Utilize mechanical techniques for juniper removal and slash removal, such as “lop and scatter,” “jackpot burning,” or “hand pile/burn,” with the aim of retaining an intact sagebrush component within treatment areas.</p>
	<p>IRG-JPR-3-2 Complete jackpot burning during the spring, when environmental conditions are favorable for the retention of shrubs; however, avoid disturbance to sage-grouse during critical biological timeframes (e.g., lekking and spring movements).</p>
	<p>IRG-JPR-3-3 Eliminate all limbs from felled trees in excess of 4 feet in height to reduce perching opportunities for avian predators.</p>
	<p>IRG-JPR-3-4 Consider seeding Phases I and II conifer removal areas prior to treatment if the perennial grass community is in poor condition (&lt;2 plants/10ft, &lt;1 plant/10ft) on dry and wet sites, respectively, or if exotic annual grasses are present. Broadcast seeding prior to soil disturbance or under slash may increase the chances of establishment.</p>
	<p>IRG-JPR-3-5 For all juniper treatment areas (regardless of juniper phase), rest treated areas from grazing until understory perennial grasses are re-established and can sustain disturbance. Length of rest will depend on understory composition at the time of treatment and the response of desirable vegetation following treatment. Set quantifiable objectives for post-treatment vegetation recovery based on pre-treatment monitoring data, and return to livestock grazing only when objectives have been met.</p>
	<p>IRG-JPR-3-6 Design juniper treatments to retain a majority of the understory shrub/grass/forb vegetation component. Understory removal should not exceed 50% of the shrub component present prior to treatment.</p>
	<p>IRG-JPR-3-7 Retain pre-settlement juniper because they provide important habitat for other wildlife and may have cultural significance.</p>
	<p>IRG-JPR-3-8 Pretreat the treatment area with herbicides if invasive grasses are present.</p>
	<p>IRG-JPR-3-9 Schedule all juniper slash treatments using fire within 12–18 months after felling for jackpot burning and 12–24 months for hand piles. Timing of slash treatments is important to ensure the presence of fine needles and twigs, which aid in ignition and consumption as well as protecting against establishment of invasive annual grasses in burned spots.</p>
	<p>IRG-JPR-4-1 Because Phase III stands generally lack a desirable understory shrub and grass component, recognize that conifer removal areas will likely require seedings and plantings of shrubs and perennial grasses.</p>

	<p>IRG-JPR-4-2 Recognize that prescribed fire can have immediate short- and/or long-term negative effects on sage-grouse habitat, and that there are limited situations where prescribed fire may be a safe tool to remove Phase III juniper (in light of declining sage-grouse habitat trends due to wildfire and other threats). Careful consideration and documentation of a project-specific rationale for using prescribed fire should precede prescribed fires and must identify the benefits of prescribed fire over alternative methods and address risks to sage-grouse habitat. If prescribed fire is warranted, adhere to IRGs to reduce the risk of habitat loss.</p> <p>IRG-JPR-4-3 Limit prescribed fire to higher elevations where there is little risk of invasive plant establishment post-treatment (e.g., high resistance and resilience).</p> <p>IRG-JPR-4-4 Limit prescribed fire treatments to a mosaic such that only one-third of treatment areas are burned (not to exceed 160 acres). This will ensure there are proximal seed sources for sagebrush, native grass, and forb regeneration. A mosaic approach should consider the spatial and habitat needs of sage-grouse in order to allow for their continued use of the treatment area.</p> <p>IRG-JPR-4-5 Limit prescribed fires to seasonally and environmentally appropriate times to prevent unintentional fire escape but yet achieve desired juniper removal goals.</p> <p>IRG-JPR-4-6 Ensure that timing of prescribed burns does not interfere with sage-grouse behaviors such as lekking and seasonal movements.</p> <p>IRG-JPR-4-7 Avoid prescribed fire in low-elevation, xeric sagebrush communities (e.g., low resistance and resilience).</p>
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**Additional information and resources**

- Decision support tool to identify and prioritize areas for juniper removal (see ORegon Decision Support System for Sagebrush Steppe in Appendix 8).
- At the site-specific scale, state-and-transition models for mid- and high-elevation zones can assist in identifying the current vegetation state of a site and associated management actions required for restoration (see Figures 3 and 4 in Appendix 8).
- Prescriptions for juniper removal on any given site should also be based on a field investigation that utilizes Ecological Site information and guidance provided in USGS Circular 1321 (Miller et al. 2007).
- The Fire and Invasives Assessment Team (FIAT) convened by the BLM has identified priority habitat areas and management strategies to reduce the threats to sage-grouse resulting from juniper reduction.
- Chambers et al. 2014.

**Invasive Annual Grasses (IAG)**

Relevant Action	Implementation Recommendations and Guidelines (IRGs)
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<p>Action IAG-2</p> <p>Implement invasive annual-grass management plans for each PAC that identifies priority areas for prevention.</p>	<p>IRG-IAG-2-1      Prioritize prevention in sites with low annual-grass occupancy and low resilience and resistance. These sites will generally be low-elevation areas in the most desirable vegetation states (states A and B in the low-elevation state-and-transition model).</p> <p>IRG-IAG-2-2      Avoid using fire as a habitat management tool in zones with &lt;12 inches precipitation or lower elevations (e.g., with low resistance and resilience). Note <i>treatment</i> and <i>restoration</i> exception: pre-treatment of infested areas with prescribed fire is often indicated to enhance the success of herbicide treatments.</p> <p>IRG-IAG-2-3      Power-wash vehicles involved in development projects, as well as for fuels management or fire suppression activities, prior to and after use.</p> <p>IRG-IAG-2-4      Require IRGs for construction projects in and adjacent to sagebrush to prevent invasion.</p> <p>IRG-IAG-2-5      Require herbicide treatments to coincide with blading of road shoulders.</p>
<p>Action IAG-3</p> <p>Implement invasive plant management plans for each PAC that identifies priority areas for treatment and restoration.</p>	<p>IRG-IAG-3-1      Prioritize treatment and restoration in sites with high resilience and resistance and low annual-grass occupancy. Considerable interventions will be required to transition low-elevation sites from degraded sagebrush and exotic annual-grass states (state-and-transition model states C and D, respectively) to more desirable states (state A, sagebrush perennial herbaceous state, and state B, perennial herbaceous state), as these sites do not have the potential to restore naturally.</p> <p>IRG-IAG-3-2      Tailor restoration strategies (e.g., aerial or broadcast versus drill seeding versus plantings, use of drought-tolerant species, use of experimental techniques like coated seeds) according to site-specific resistance and resilience to ensure greatest likelihood of plant establishment.</p> <p>IRG-IAG-3-3      Aggressively treat invasive plants where they threaten the quality of sage-grouse habitat, particularly in the prioritized restoration sites described above.</p> <p>IRG-IAG-3-4      Use appropriate certified weed-free seed mixes in habitat restoration with the goal to establish perennial grasses, forbs, and shrubs.</p> <p>IRG-IAG-3-5      When supply is limited, use native seed in sites within PACs that have ecological characteristics that are most favorable for plant establishment.</p> <p>IRG-IAG-3-6      Utilize locally sourced native plant species when available and consider seed mixes that contain aggressive, fire-resistant, non-native perennial species that are competitive with invasive weeds to initially stabilize plant communities to allow for long-term recovery of sagebrush and other native species.</p> <p>IRG-IAG-3-7      Rest restoration areas from grazing until understory perennial grasses are re-established and can sustain disturbance. Length of rest will depend on understory composition at the time of treatment, restoration potential of the site, and the response of desirable vegetation following treatment. Set quantifiable objectives for post-treatment vegetation recovery based on pre-treatment monitoring data; return livestock grazing only when objectives have been met.</p>

<p>Action IAG-4</p> <p>Implement invasive plant management plans for each PAC that identifies priority areas to contain existing patches of invasive weeds.</p>	<p>IRG-IAG-4-1 Utilize approved herbicides known to be most effective to treat the target species and in accordance with the concentration, application method and season, and frequency known to provide the best results.</p>
<p><b>Additional information and resources</b></p>	
<ul style="list-style-type: none"> <li>• Decision support tool to identify and prioritize areas for invasive annual-grass prevention and treatment (see ORegon Decision Support System for Sagebrush-Steppe in Appendix 8).</li> <li>• At the site-specific scale, state-and-transition models for mid- and high-elevation zones can assist in identifying the current vegetation state of a site and associated management actions required for restoration (see Figures 3 and 4 in Appendix 8).</li> <li>• Chambers et al. 2014.</li> <li>• Decision guides developed through the Agricultural Research Service’s Ecologically-Based Invasive Plant Management (EBIPM) program should be utilized when developing and implementing invasive species management plans (ebipm.org).</li> <li>• Fire and Invasives Assessment Team (FIAT) convened by the BLM has identified priority habitat areas and management strategies to reduce the threats to sage-grouse resulting from invasive annual grasses.</li> <li>• BLM Handbook H-1740-2.</li> </ul>	
<p><b>Wildfire (WF)</b></p>	
<p><b>Relevant Action</b></p>	<p><b>Implementation Recommendations and Guidelines (IRGs)</b></p>
<p>Action WF-1-6</p> <p>Conduct fuel management treatments, including those identified below, designed to protect existing high-quality sagebrush habitat, modify fire behavior, restore native plants, and create habitat resilience and landscape patterns that benefit sage-grouse (see Section 7b (iii) in SO 3336 Implementation Plan).</p>	<p>IRG-WF-1-6 If considering use of prescribed fire to reduce fuel loads in Phase III juniper, refer to IRG-JPR-4-2 through IRG-JPR-4-7. Use prescribed fire to reduce fuel loads in a prudent manner. Avoid using fire as a habitat management tool in zones with &lt;12 inches precipitation or at lower elevations (e.g., with low resistance and resilience); use prescribed fire in a manner that limits mortality of understory plants and the risk of invasive annual-grass establishment.</p>
<p>Action WF-1-6b</p> <p>Strategically use livestock grazing to reduce fuel loads in years with high accumulation of fuels to reduce wildfire risk, using grazing management that maintains or improves the native plant community health (e.g., dormant season use). (See related Action WF-3-4b in Section IV.)</p>	<p>IRG-WF-1-6b-1 Assess site-specific conditions (e.g., resistance and resilience) to determine if fuel reduction via livestock grazing is necessary or recommended.</p> <p>IRG-WF-1-6b-2 Ensure that fuel load reduction using livestock is compatible with other wildlife needs besides fire prevention.</p>
<p>Action WF-1-6c</p>	<p>IRG-WF-1-6c When designing fuel breaks, consider the following:</p>

<p>Monitor and maintain fuel breaks to prevent annual-grass invasion in these disturbed areas and to determine if species planted in green strips spread beyond fuel breaks.</p>	<p>(1) the potential fire containment benefits versus the area of sage-grouse habitat lost in the fuel break footprint  (2) existing roads or utility corridors that could be widened with mowing, green-stripping, or black-stripping  (3) natural fuel breaks  (4) prevailing winds that may influence the placement of fuel breaks (e.g., prioritize east-to-west roads or place on south side of road if only one side is mowed)  (5) use of fire-resistant perennial species (e.g., crested wheatgrass or forage kochia) as an effective means to slow the spread of fire while preventing the establishment of non-native annual grasses. Consider the risk of these species spreading beyond seeded fuel breaks.</p>
<p>Action WF-1-6d</p> <p>In areas identified to be at very high risk for wildfire, with dense sagebrush that may contribute to fuel loads and where patch removal of sagebrush has been determined to not have a negative impact on sage-grouse, create a mosaic of sagebrush density to intersperse areas of low fuel continuity (less than 25 acres in size and composing less than 15% of the treatment block) among areas of desired shrub density required by sage-grouse.</p>	<p>IRG-WF-1-6d-1 Create a mixture of sagebrush seral stages and canopy coverages in treatment areas based on the ecological conditions of the project site while maintaining (1) necessary habitat for sage-grouse and (2) habitat objectives outlined in this Plan (see Section III) and in the 2011 Strategy (ODFW 2011). See Table 2-5 in BLM RMP (2015) for additional guidance. See also IRG-SBE-2-1 through IRG-SBE-2-8 related to use of mechanical or chemical means to achieve the desired mosaic of sagebrush density.</p> <p>IRG-WF-1-6d-2 Achieve mosaics of sagebrush density by using spot treatments (e.g., incomplete burns under strict fire condition requirements, or chemical or mechanical treatments) on areas of less than 25 acres and making up less than 15% of the treatment block.</p> <p>IRG-WF-1-6d-3 Recognize that prescribed fire can have immediate short- and/or long-term negative effects on sage-grouse habitat, and that there are limited situations where prescribed fire may be a safe tool to diversify sagebrush density (in light of declining sage-grouse habitat trends due to wildfire and other threats). Careful consideration and documentation of a project-specific rationale for using prescribed fire should precede prescribed fires and must identify the benefits of prescribed fire over alternative methods and address risks to sage-grouse habitat. If prescribed fire is warranted, adhere to IRGs to reduce the risk of habitat loss.</p> <p>IRG-WF-1-6d-4 Limit prescribed fire to higher elevations where there is little risk of invasive plant establishment post-treatment (e.g., high resistance and resilience).</p> <p>IRG-WF-1-6d-5 Limit prescribed fires to seasonally and environmentally appropriate times to prevent unintentional fire escape but yet achieve desired juniper removal goals.</p> <p>IRG-WF-1-6d-6 Ensure that timing of prescribed burns does not interfere with sage-grouse behaviors such as lekking and seasonal movements.</p> <p>IRG-WF-1-6d-7 Avoid prescribed fire in low-elevation, xeric sagebrush communities (e.g., low resistance and resilience).</p>

<p>Action WF-4</p> <p>Coordinate with private and federal land managers to prioritize post-fire rehabilitation and ensure that adequate resources are available for emergency stabilization and ongoing restoration activities to protect, maintain, or restore sage-grouse habitat within PAC areas and to restore connectivity between PAC areas (see sections 7b (v) and 7b (vi) of SO 3336 Implementation Plan).</p>	<p>IRG-WF-4</p> <p>Focus livestock grazing away from burned areas and sites that have undergone rehabilitation or restoration treatments if rest is needed to ensure successful site recovery or restoration. Use “grass banks” or reserve allotments for grazers displaced by fire and rehabilitation treatments.</p>
<p><b>Additional information and resources</b></p> <ul style="list-style-type: none"> <li>• Decision support tool to identify and prioritize areas for wildfire prevention, containment, and rehabilitation (see OREGON Decision Support System for Sagebrush-Steppe in Appendix 8).</li> <li>• BLM Instruction Memorandum 2013-128 provides direction on sage-grouse conservation during fire operations and fuels management activities.</li> <li>• Fire and Invasives Assessment Team (FIAT) convened by the BLM has identified priority habitat areas and management strategies to reduce the threats to sage-grouse resulting from wildfires. This information will guide and quantify future fire risk reduction, suppression, and capacity-building activities planned by federal, State, local, and private land management entities and partners.</li> <li>• BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Appendix C (“Required design features and implementation recommendations and guidelines”).</li> <li>• BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Tables 2-4 (“Seasonal habitat indicators and desired conditions”) and 2-5 (“Desired mix of sagebrush classes”).</li> </ul>	
<p><b>Development (DEV), including Urban &amp; Exurban Development, Renewable Energy, Electric and Natural Gas Transmission, Mining, Roads, and Other Infrastructure</b></p>	
<p>Relevant Action</p>	<p>Implementation Recommendations and Guidelines (IRGs)</p>
<p>Action DEV-8</p> <p>Eliminate or minimize risk to sage-grouse by utilizing IRGs in the siting, construction, operation, and maintenance of new or existing infrastructure.</p>	<p>IRG-DEV-8-1</p> <p>Locate construction or project camps outside of priority sage-grouse habitat.</p> <p>IRG-DEV-8-2</p> <p>Consolidate structures and infrastructure associated with development (e.g., co-locate new features with existing infrastructure) where other relevant federal and State regulations allow. Locate new infrastructure in already disturbed locations where habitat restoration has not occurred.</p> <p>IRG-DEV-8-3</p> <p>Minimize the number of tall structures (communication towers, power lines, or other features) and construct such structures to minimize predator subsidies and perching opportunities.</p> <p>IRG-DEV-8-4</p> <p>Identify opportunities to bury distribution power and communication lines in PAC habitat in consideration of engineering and operational factors.</p> <p>IRG-DEV-8-5</p> <p>Avoid tall structures within 2 to 5 miles of leks.</p> <p>IRG-DEV-8-6</p> <p>Evaluate site-specific considerations when considering the requirement and design of perch deterrents on elevated structures (including retrofitting existing structures). Consider the potential risks to protected raptors, facilitation of corvid nesting, and anticipated benefits to sage-grouse.</p> <p>IRG-DEV-8-7</p> <p>Minimize the construction of new roads; avoid new road construction in PACs. Utilize existing roads rather than constructing new roads to access developments.</p>



IRG-DEV-8-8	Where new roads are required, design them to the minimal standard required for their intended purpose and restrict new access routes to authorized users.
IRG-DEV-8-9	Limit motorized travel to designated roads.
IRG-DEV-8-10	Establish speed limits or design roads to be driven at slower speeds to reduce vehicle-wildlife collisions.
IRG-DEV-8-11	Minimize the construction of fences, particularly within 4 miles of leks. Mark any required fencing with antistrike markers.
IRG-DEV-8-12	Clean up refuse and eliminate food subsidies for predators of sage-grouse.
IRG-DEV-8-13	Develop and implement invasive annual-grass management plans to treat disturbed soil associated with development and avoid activities likely to establish and spread invasive annual grasses.
IRG-DEV-8-14	Conduct systematic surveys within developments to detect areas of expanding invasive annual grasses and expedite reporting and treatment of new infestations.
IRG-DEV-8-15	Monitor areas impacted by ground-disturbing activities for a minimum of 3 years and apply herbicide to new invasions of annual grass expeditiously.
IRG-DEV-8-16	Restore disturbed soil with appropriate certified weed-free seed mixes and native plants.
IRG-DEV-8-17	Power-wash vehicles and equipment involved in development projects prior to entering the project area.
IRG-DEV-8-18	Avoid developments that produce noise above levels documented to disrupt sage-grouse behavior (10 decibels above ambient noise levels).
IRG-DEV-8-19	Add design features (e.g., noise shields) to minimize noise associated with developments.
IRG-DEV-8-20	Limit noise to less than 10 decibels above ambient noise levels during lekking time periods.
IRG-DEV-8-21	Convert generator- or windmill-powered pumps to solar when economically feasible.
IRG-DEV-8-22	Avoid installation of compressor stations in PAC areas or other sage-grouse habitat where noise would be disruptive to sage-grouse behaviors.
IRG-DEV-8-23	Apply seasonal or timing restrictions within 4 miles of leks for construction, operation, and maintenance activities to minimize disturbance to sage-grouse life history behaviors (breeding, nesting, and early brood rearing). <sup>1</sup>
IRG-DEV-8-24	Use directional and horizontal drilling to reduce surface disturbance.
IRG-DEV-8-25	If mining operations require pits or water impoundments, include design features to reduce or eliminate the threat from West Nile virus to sage-grouse

<b>Additional information and resources</b>	
<ul style="list-style-type: none"> <li>Manier et al. 2014. Conservation buffer distance estimates for greater sage-grouse.</li> <li>Avian Power Line Interaction Committee 2014. The implementation recommendations and guidelines for electric utilities in sage-grouse habitat .</li> </ul>	
<b>Sagebrush Elimination (SBE)</b>	
<b>Relevant Action</b>	<b>Implementation Recommendations and Guidelines (IRGs)</b>

<sup>1</sup> Seasonal restrictions for development activities (e.g., construction of new buildings, fences, or power lines) on private lands enrolled in CCAAs are indicated (USFWS 2014).

<p>Action SBE-2</p> <p>Where warranted, strategically use chemical or mechanical treatments to remove sagebrush in areas with the highest potential to achieve treatment objectives, while minimizing the risk of annual-grass invasion and habitat fragmentation and loss.</p>	<p>IRG-SBE-2-1 Identify and avoid connectivity corridors, winter concentration areas, or key winter habitat for sage-grouse prior to conducting sagebrush elimination treatments.</p> <p>IRG-SBE-2-2 Plan chemical or mechanical treatments that remove sagebrush in mosaic patterns within the context of a large landscape plan.</p> <p>IRG-SBE-2-3 Conduct treatments in areas with relatively high shrub cover (&gt;25%) and without an understory of annual grasses to improve the herbaceous understory for brood rearing, particularly where such habitats may be limiting.</p> <p>IRG-SBE-2-4 Avoid chemical and mechanical treatments in known winter habitat.</p> <p>IRG-SBE-2-5 Use “brush beating” only where appropriate as a tool to increase the production and diversity of understory species to benefit sage-grouse habitat.</p> <p>IRG-SBE-2-6 Use brush beating in strips or mosaic patterns that are 12 to 50 feet wide, with untreated interspaces 3 times the width of the treated strips.</p> <p>IRG-SBE-2-7 Chemical treatments to remove sagebrush should employ all IRGs and use only approved herbicides.</p> <p>IRG-SBE-2-8 If vegetation treatments are conducted in plant communities dominated by exotic annual species, herbicides and reseeding will be required to re-establish perennial vegetation and allow for long-term recovery of sagebrush and other native species.</p>
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<p><b>Additional information and resources</b></p>	
<ul style="list-style-type: none"> <li>• Decision support tool to identify and prioritize areas in which to avoid sagebrush treatments (see OREGON Decision Support System for Sagebrush-Steppe in Appendix 8).</li> <li>• BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Appendix C (“Required design features and implementation recommendations and guidelines”).</li> <li>• BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Tables 2-4 (“Seasonal habitat indicators and desired conditions”) and 2-5 (“Desired mix of sagebrush classes”).</li> </ul>	

<p><b>Improper Grazing Management (GRZ)</b></p>	
<p>Relevant Action</p>	<p>Implementation Recommendations and Guidelines (IRGs)</p>
<p>Action GRZ-3-2</p> <p>Assess water developments for livestock and modify features according to IRGs to minimize threats to sage-grouse.</p>	<p>IRG-GRZ-3-2a Reduce the concentration of livestock that would be to the detriment of key sage-grouse habitat.</p> <p>IRG-GRZ-3-2b Allow wildlife access.</p> <p>IRG-GRZ-3-2c Eliminate the risk of sage-grouse (and other wildlife) entrapment.</p> <p>IRG-GRZ-3-2d Reduce breeding opportunity for mosquitoes.</p>

<p>Action GRZ-2-6</p> <p>Conduct range management activities using IRGs to avoid disruption to lekking and nesting behaviors.</p>	<p>IRG-GRZ-2-6a Avoid disruptive activities (noise; foot, vehicle, or off-highway vehicle (OHV) traffic; etc.) between 1 hour after sunset and 2 hours after sunrise from March 1 through June 30 within 0.6 miles and 1.2 miles of occupied and pending leks on private and BLM lands, respectively.<sup>2</sup> Brief activities essential for routine ranch operations (e.g., herding or trailing livestock into or out of an area, repairing fences, doctoring livestock, locating lost livestock, irrigation work) are excepted.</p> <p>IRG-GRZ-2-6b Reduce OHV traffic in nesting habitat (within 2 miles of leks) from March 1 through June 30.</p> <p>IRG-GRZ-2-6c Schedule livestock turnout and trailing to avoid livestock concentrations on leks during the sage-grouse breeding season (March 1–June 30).<sup>3</sup></p> <p>IRG-GRZ-2-6d Alter hay-cutting patterns to reduce incidental mortality of sage-grouse.</p>
<p>Action GRZ-3-8</p> <p>Design and locate range management infrastructure according to IRGs so that there is either a neutral effect or a benefit to sage-grouse.</p>	<p>IRG-GRZ-3-8a Construct new livestock facilities (troughs, corrals, handling facilities, “dusting bags,” etc.) at least 0.6 miles and 1.2 miles from leks (on private and BLM lands, respectively) to avoid livestock concentrations, collision hazards, and avian predator perches.<sup>1</sup> Tall structures in particular should be further away from leks (a minimum of 2 miles) or out of line of sight.</p> <p>IRG-GRZ-3-8b Remove or modify structures that contribute negatively to sage-grouse behavior or their habitat.</p> <p>IRG-GRZ-3-8c Use the Fence Collision Risk Tool to identify high-risk fences, particularly within 1.2 miles of leks in PACs, and mark them with antistrike devices.</p> <p>IRG-GRZ-3-8d Consider impacts to sage-grouse when placing new fences and avoid fences within 1.2 miles of leks.</p>
<p>Action GRZ-3-9</p> <p>Remove predator (corvid, coyote, raptor) attractants; remove and bury dead animals.</p>	<p>IRG-GRZ-3-9 Disposal of dead animals (bone piles) and dumps should not occur within 4 miles of leks.</p>
<p>Action GRZ-5</p> <p>Minimize direct impacts (mortality) and indirect impacts (reduction of forage) to sage-grouse when applying insecticides within sage-grouse habitat.</p>	<p>IRG-GRZ-5-1 Avoid spraying insecticides in May and June to maintain adequate insect populations during the early development of sage-grouse chicks.</p> <p>IRG-GRZ-5-2 Use approved chemicals; balance chemical toxicity to sage-grouse with insect control effectiveness.</p>
<p>Additional information and resources</p> <ul style="list-style-type: none"> <li>• Programmatic CCAAs.</li> <li>• Technical bulletins and expertise available through SWCDs, NRCS, ARS, and others.</li> </ul>	
<p><b>Agricultural Conversion (AGC)</b></p>	
<p>Relevant Action</p>	<p>Implementation Recommendations and Guidelines (IRGs)</p>

<sup>2</sup> A 0.6-mile buffer is consistent with CCAAs (USFWS 2014); a 1.2-mile buffer is consistent with the BLM RMP (BLM 2015). Note that site-specific geographic features that attenuate disturbance may allow for smaller buffers.

<sup>3</sup> This is consistent with Action LG/RM 3 in BLM RMP (BLM 2015).

Action AGC-4	IRG-AGC-4-1	Add shrubs, forbs, and native grasses to monotypic perennial grass stands through active or passive management.
Avoid agricultural conversion of sagebrush.	IRG-AGC-4-2	Restore or enhance habitat for sage-grouse by managing appropriate vegetation composition and structure so there is a balance between nesting, brood-rearing, and winter habitat.
<b>Additional information and resources</b>		
<ul style="list-style-type: none"> <li>BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Appendix C (“Required design features and implementation recommendations and guidelines”).</li> <li>BLM Oregon Greater Sage-Grouse Proposed RMPA/Final EIS, Tables 2-4 (“Seasonal habitat indicators and desired conditions”) and 2-5 (“Desired mix of sagebrush classes”).</li> </ul>		
<b>Recreation (REC)</b>		
<b>Relevant Action</b>	<b>Implementation Recommendations and Guidelines (IRGs)</b>	
Action REC-1	IRG-REC-1-1	When feasible, reroute trails outside of PAC areas and restore vegetation on abandoned trails.
Avoid development of recreational facilities (e.g., roads, trails, kiosks, and campgrounds) in sage-grouse habitats, particularly within PACs and within 4 miles of leks to preserve key lekking and nesting habitat.	IRG-REC-1-2	Designate OHV areas outside of priority sage-grouse habitat.
	IRG-REC-1-3	Ensure that facilities do not provide predator nesting or perching opportunities.
<b>Fences (FNC)</b>		
<b>Relevant Action</b>	<b>Implementation Recommendations and Guidelines (IRGs)</b>	
Fences (FNC)	IRG-FNC-3-1	Use permanent fence markers (3-inch length) equipped with reflective tape in order to ensure visibility when terrain is snow covered. When reflective tape is not available, black and white markers may be substituted to improve detection by sage-grouse.
Prioritize installing antistrike devices and perch deterrent devices on fence segments that pose the highest risk to sage-grouse (as identified by the Fence Collision Risk Tool) within 1.2 (2 km) of leks within PAC habitat.	IRG-FNC-3-2	Install markers at 3-foot intervals.
<b>Additional information and resources</b>		
<ul style="list-style-type: none"> <li>Fence Collision Risk Tool.</li> </ul>		
<b>Isolated/Small Size/Connectivity (CON)</b>		
<b>Relevant Action</b>	<b>Implementation Recommendations and Guidelines (IRGs)</b>	
Action CON-3	IRG-CON-3-1	Identify and avoid connectivity corridors prior to conducting sagebrush elimination treatments on public lands.

Prevent loss of connectivity corridors by encouraging private landowners to participate in long-term or permanent sagebrush habitat protection or enhancement programs. Protect connectivity corridors on private and public land from future development or habitat projects that reduce or eliminate sagebrush.	IRG-CON-3-2	Within connectivity corridors, balance the intent, position, and extent of fuel breaks with the direct habitat loss caused by such fire prevention measures.
Action CON-4  Where appropriate, consider augmenting small or isolated populations and use best management techniques for translocations.	IRG-CON-4-1 IRG-CON-4-2 IRG-CON-4-3  IRG-CON-4-4 IRG-CON-4-5	Investigate and understand the genetic implications of translocations before implementation. Use translocation as a last resort to bolster small populations. Consult wildlife managers with prior translocation experience to identify and implement IRGs (e.g., methods; gender/age of birds; season) to ensure project success.  Obtain birds for translocations from larger, stable populations. As required, reduce threats to translocated birds to ensure the success of population augmentation efforts (e.g., remove predator subsidies, mark or remove fences, etc.).
Additional information and resources		
<ul style="list-style-type: none"> <li>Decision support tool to identify and prioritize connectivity corridors for enhancement or protection (see ORegon Decision Support System for Sagebrush-Steppe in Appendix 8).</li> </ul>		
<b>Drought (DRT)</b>		
Relevant Action	Implementation Recommendations and Guidelines (IRGs)	
Action DRT-1-2  Follow recommended grazing guidelines during drought conditions to meet seasonal sage-grouse habitat requirements. Consider (1) season or timing of use; (2) numbers of livestock (including temporary non-use or livestock removal); (3) distribution of livestock use; (4) intensity of use; and (5) type of livestock.	IRG-DRT-1-2a IRG-DRT-1-2b  IRG-DRT-1-2c IRG-DRT-1-2d  IRG-DRT-1-2e  IRG-DRT-1-2f	Adjust grazing in a timely manner to respond to environmental conditions such as drought. Implement management changes such as grazing rest, deferment, rotation, seasonal use, timing, intensity, etc. Anticipate the need for, and make provisions to utilize, grass banks. Due to water scarcity during drought, monitor riparian areas and implement conservation measures to ensure bank stability, survival of deep-rooted riparian vegetation, floodplain connectivity, and stream functionality. Where necessary, develop new water sources for livestock and wildlife in order to provide reliable water and forb/insect production during drought conditions. Incorporate design features in new water developments to reduce the risk of West Nile virus and consider fencing to protect wetlands for sage-grouse use. When monitoring demonstrates that grazing has contributed to forage use levels that are detrimental to habitat quality, adjust grazing to minimize the impact to sage-grouse.
Additional information and resources		
<ul style="list-style-type: none"> <li>Programmatic CCAAs.</li> <li>Technical bulletins and expertise available through SWCDs, NRCS, ARS, and others.</li> </ul>		

<b>West Nile Virus (WNV)</b>		
Relevant Action	Implementation Recommendations and Guidelines (IRGs)	
Action WNV-3  When planning or modifying water developments, use IRGs to mitigate potential impacts from WNV and encourage the design of water development structures to minimize WNV risk to sage-grouse.	IRG-WNV-3-1	Where deemed necessary, change irrigation techniques from flood to sprinkler systems to minimize standing water that serves as mosquito habitat.
	IRG-WNV-3-2	Minimize unnecessary standing water and control water overflow to prevent standing water conditions.
Action WNV-4  Cooperate with responsible agencies to implement feasible recommended mosquito control guidelines.	IRG-WNV-4-1	Use appropriate Environmental Protection Agency (EPA)-regulated larvicides and/or adulticides in areas proximal to key sage-grouse habitat where mosquito habitat cannot be reduced.
	IRG-WNV-4-2	Evaluate the effectiveness of spraying adult mosquitoes and consider using mosquito-specific control measures.
	IRG-WNV-4-3	Balance the benefits of mosquito control to sage-grouse with other environmental considerations (e.g., benefits to other species dependent on mosquitoes).
<b>Catastrophic Flooding (FLD)</b>		
Relevant Action	Implementation Recommendations and Guidelines (IRGs)	
Action FLD-2-1  Follow recommended grazing guidelines during catastrophic flooding conditions to meet seasonal sage-grouse habitat requirements. Consider (1) season or timing of use; (2) numbers of livestock (including temporary non-use or livestock removal); (3) distribution of livestock use; (4) intensity of use; and (5) type of livestock.	IRG-FLD-2-1a	Adjust grazing in a timely manner to respond to environmental conditions such as catastrophic flooding.
	IRG-FLD-2-1b	Implement management changes such as grazing rest, deferment, rotation, seasonal use, timing, intensity, etc.
	IRG-FLD-2-1c	Anticipate the need for, and make provisions to utilize, grass banks.
Additional information and resources <ul style="list-style-type: none"> <li>• Programmatic CCAAs.</li> <li>• Technical bulletins and expertise available through SWCDs, NRCS, ARS, and others.</li> </ul>		
<b>Predation (PRD)</b>		
Relevant Action	Implementation Recommendations and Guidelines (IRGs)	
Action PRD-1  Use IRGs to reduce anthropogenic influences that artificially boost predator populations or	IRG-PRD-1-1	Prioritize installing perch deterrent devices on fence segments that pose the highest risk to sage-grouse (as identified by the Fence Collision Risk Tool) within 1.2 (2 km) of leks within PAC habitat.
	IRG-PRD-1-2	Clean up refuse and eliminate food subsidies for predators of sage-grouse (e.g., bone piles, dumps, etc.).

<p>provide predator hunting advantages in PACs and within 4 miles of leks.</p>	<p>IRG-PRD-1-3 IRG-PRD-1-4 IRG-PRD-1-5  IRG-PRD-1-6 IRG-PRD-1-7 IRG-PRD-1-8 IRG-PRD-1-9  IRG-PRD-1-10 IRG-PRD-1-11  IRG-PRD-1-12  IRG-PRD-1-13</p>	<p>Avoid development of recreational facilities (e.g., roads, trails, kiosks, and campgrounds) within 4 miles of leks. Ensure that recreational facilities do not provide nesting or perching opportunities.</p> <p>Avoid development projects (energy, mining, infrastructure, etc.) in PACs.</p> <p>Construct new livestock facilities (troughs, corrals, handling facilities, “dusting bags,” etc.) at least 0.6 miles and 1.2 miles from leks (on private and BLM lands, respectively) to avoid avian predator perches. Tall structures in particular should be further away from leks (a minimum of 2 miles) or out of line of sight.</p> <p>Minimize the number of tall structures (communication towers, power/transmission lines, or other features) constructed so as to minimize predator subsidies and perching opportunities.</p> <p>Identify opportunities to bury distribution power and communication lines in PACs.</p> <p>Avoid tall structures within 2-5 miles of leks.</p> <p>Evaluate site-specific conditions when considering the requirement and design of perch deterrents on elevated structures (including retrofitting existing structures). Consider the potential risks to protected raptors, the facilitation of corvid nesting, and the anticipated benefits to sage-grouse.</p> <p>Protect intact habitat that affords adequate hiding cover for sage-grouse. Reduce environmental conditions that provide predator hunting advantages.</p> <p>Protect intact sagebrush habitat from habitat loss, degradation, and fragmentation, using conservation measures described in this Action Plan to address conifer expansion, invasive annual grasses, wildfires, sagebrush elimination, agricultural conversion, development, recreation, and grazing.</p> <p>Prioritize juniper removal within 1 mile of known leks (with an active or pending status) and then expand juniper removal to within 4 miles of known leks to reduce predator perching and nesting opportunities.</p> <p>Restore fragmented and degraded habitat in which predators have increased hunting efficacy.</p>
<p><b>Sagebrush Defoliator Moth (SDM)</b></p>		
<p>Relevant Action</p>	<p>Implementation Recommendations and Guidelines (IRGs)</p>	
<p>Action SDM-1</p> <p>Assess areas impacted by Aroga moth to determine the extent of damage to sagebrush, and implement recommended guidelines and activities to reduce the risk of annual-grass invasion and wildfire.</p>	<p>IRG-SDM-1-1  IRG-SDM-1-2</p>	<p>Use state-and-transition models to determine the existing ecological state of areas damaged by Aroga moths, and apply resistance and resilience to guide actions to prevent annual-grass establishment or to restore moth-impacted sites (see conservation actions relating to invasive annual-grass prevention and restoration).</p> <p>Assess large areas of sagebrush killed by Aroga moths to determine how their configuration within the greater landscape and potential additive fuel loads may contribute to wildfire severity.</p>
<p>Additional information and resources</p>		
<ul style="list-style-type: none"> <li>• State-and-transition models.</li> <li>• Chambers et al. 2014.</li> </ul>		

