Appendix C

Sagebrush Steppe Conservation Measures

for

Greater Sage-grouse (*Centrocercus urophasianus*)
Sagebrush Sparrow (*Artemisiospiza nevadensis*)
Brewer's Sparrow (*Spizella breweri*)
Sage Thrasher (*Oreoscoptes montanus*)

Developed in partnership by

U.S. Fish and Wildlife Service
Bureau of Land Management
U.S. Forest Service
Thunder Basin Grasslands Prairie Ecosystem Association

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The Association has developed a Strategy intended to purposefully place conservation effort within the Coverage Area where it is most likely to achieve durable conservation benefit. The Strategy includes Conservation Measures which are consistent with the FWS approved Greater Sage-grouse Umbrella CCAA for Wyoming Ranch Management (Statewide CCAA), while also addressing the multiple threats, including energy development, identified in the final report of the Greater Sage-grouse Conservation Objectives Team (COT). The following Sagebrush Steppe Assemblage threats and associated Conservation Measures are listed below using the FWS's five threat factors to categorize the threats and their respective Conservation Measures:

Factor A: The present or threatened destruction, modification, or curtailment of habitat or range;

Factor B: Overutilization for commercial, recreational, scientific, or education purposes;

Factor C: Disease and predation;

Factor D: Inadequacy of existing regulatory mechanisms; and

Factor E: Other natural or manmade factors affecting the species' continued existence.

It is the intent of the Association to provide for heterogeneity on a landscape level while supporting local homogeneity in specific sites across the Coverage Area. The Conservation Measures indicated below deal with species that primarily favor the sagebrush steppe ecotype. Conservation Measures should begin within 1 year of signing the CI or CI/CP document. Implementation of all Conservation Measures should be underway within 5 years of signing. Specific timelines and exceptions will be agreed upon and documented in each CI or CI/CP. See Appendix E for specific details on required point values, timing, and other information on implementation of Conservation Measures.

All spatial coordinates for the Conservation Measures detailed below must be recorded in NAD 83, UTM Zone 13 north. If you utilize a different projection, please convert GPS points and shape files to NAD 83.

General Monitoring Notes

As far as possible, annual vegetation monitoring should be conducted during the same time each year. This is especially true for vegetative trend monitoring. Raw data should be submitted in an Excel spreadsheet. Monitoring protocols can be obtained from the Association.

Conservation Measures Sorted by Threat Factor

The below table is provided as a table of contents for the Conservation Measures described in detail following the table. The table is not intended to fully describe the requirements of each Conservation Measure.

Item	Factor Area Topic / Conservation Measures Summary	Point Value	Page
A1a	bring disturbed lands to desired condition, encourage sagebrush-grasslands species	6	7
A1b	commit to no new conversion of sagebrush to cropland	6	7
	Energy development: Mining		
A2	increase and sustain extent of sagebrush/forb mosaic reestablishment - double approved	2	8
A3	substitute native sagebrush grassland seed mix in lieu of post-mine improved pasture seed mix	3	9
A4	incorporate landscape scale sagebrush obligate lifecycle needs into mine reclamation plan	6	10
	Energy development: Non-renewable		
A5	limit surface disturbance to 5% of suitable habitat per 640 acres	9	11
A6a	decrease new well pad size by average 20% in suitable habitat	4	11
A6b	use drill pad mats on all level sites in suitable habitat	5	12
	Facilities: Detrimental Siting Due to Lack of Information		
A7a	collect sighting & pellet count information and provide to TBGPEA for dissemination	3	12
A7b	conduct studies and other research on sagebrush steppe species & provide to TBGPEA	4	13
	Facilities: High Profile and Vertical Structures		
A8a	avoid siting facilities within 6/10mi or 1mi of lek	2	14
A8b	commit to reducing facilities within 6/10mi or 1mi of lek	1	14
A8c	avoid siting facilities within suitable habitat	5	15
A8d	commit to reducing facilities within suitable habitat	5	15
	Fences		
A9a	remove fences near leks and in suitable habitat	1	16
A9b	mark fences	1	16
A9c	avoid new fences within 6/10mi or 1mi of leks and other suitable habitat	1	17
	Fragmentation: General		
A10a	obtain or donate conservation easements with minimum 10 year term	8	17
A10b	obtain or donate acreage for use as a grass bank with a minimum 10 year term	5	18
A10c	protect, enhance or restore habitat linkages between 320 acre minimum blocks	2	18
	Fragmentation - Brewer's sparrow		
A11a	map and protect suitable habitat	2	19
A11b	map and protect habitat with known breeding activity	3	20
A11c	identify and enhance sagebrush stands to create suitable habitat	2	20
A11d	treat Russian thistle in areas of suitable habitat and reseed as necessary	2	21
	Fragmentation - sage sparrow		
A12a	map and protect suitable habitat	2	22
A12b	map and protect habitat with known breeding activity	3	22
A12c	identify and enhance sagebrush stands to create suitable habitat	2	23
A12d	establish in-fill or peripheral sagebrush areas	2	23
	Fragmentation - sage thrasher		
A13a	map and protect suitable habitat	2	24
A13b	map and protect habitat with known breeding activity	3	25
A13c	identify and enhance sagebrush stands to create suitable habitat	2	25
	Inappropriate livestock & wildlife grazing management		
A14a	develop and follow a high structure grazing management plan approved by TBGPEA	7	26
A14b	develop and sponsor a high structure grazing management plan approved by TBGPEA	8	27
A14c	develop and follow an approved grazing management plan for entire ranch	10	27
A14d	place attractants in upland locations which minimize impact to sagebrush steppe habitat	3	27
A14e	utilize public hunting access to manage wildlife numbers and associated habitat conditions	3	28
A15	manage for ≥ 6" residual vegetation height from 4/1 - 6/15 in nesting habitat	8	28
	Invasive species		
A16a1	control cheatgrass within a 320 acre block or 10% of CI or CI/CP area if less than 1,000 acres	4	29
A16a2	control cheatgrass (A16a1) and reseed with native sagebrush steppe seed mix	7	30
A16b	control salt cedar and/or Russian olive within drainage areas	4	30
A16c	remove pine, juniper, or non-sagebrush shrubs within 1/4 mile of documented habitat	3	31
A16d	control invasive plants other than cheatgrass in a managed area of at least 320 acres	3	31
A16e	control invasive or noxious weeds on rural homesites	1	32
	Loss of green vegetation and insects		
A17a	increase soil saturation while avoiding standing water by developing new water sources	2	32
A17b	increase soil saturation by installing snow fences to deposit snow in or near ephemeral draws	1	33
A17c	increase soil saturation by installing water detention (spreader) structures in ephemeral draws	2	33
A17d	increase soil saturation by reducing output of alluvial wells	1	34
A17e	develop additional water sources (a-d) and reseed areas with native forbs	2	34
A18a	protect seeps, springs, and sub-surface irrigation areas from excessive herbivore use	3	35

Conservation Measures Sorted by Threat Factor

The below table is provided as a table of contents for the Conservation Measures described in detail following the table.

The table is not intended to fully describe the requirements of each Conservation Measure.

Item	Factor / Area / Topic / Conservation Measures Summary	Point Value	Page
A18b	place attractants at least 1/4mi from riparian habitats, springs, seeps, or green areas	4	35
	Power Lines		
A19a	site distribution and transmission lines ≥ 0.6mi or 1mi from suitable habitat (operators)	6	36
A19b	sign surface use agreement avoiding power lines within 0.6mi or 1mi of suitable habitat (landowners)	6	36
A19c	move or bury existing power lines within 6/10mi or 1mi of suitable habitat	8	37
	Roads		
A20a	close & reclaim existing roads within 3mi of leks or 1-1/4mi of suitable passerine habitat	1	37
A20b	avoid building new roads within 6/10mi of suitable habitat	5	38
	Subdividing Native Habitats		
A21a	commit to preserving existing land configuration, no new subdivisions, etc.	6	39
A21b	keep native habitat on ≥ 60% of existing homesites	1	39
	Wildfires		
A22a	suppress all wildfires in suitable habitat	1	40
A22b	within 1 year after wildfires, control invasives & reseed if necessary	3	40
	Windmills		
A23	retrofit existing windmills and remove windmill towers within 1mi of leks & suitable habitat	1	41
	Habitat Curtailment		
	Crop lands		
A24a	delay cutting and baling activities until after July 31	1	42
A24b	reduce mortality by changing harvest techniques	1	42
	Energy Development: Mining		
A25a	avoid new surface occupancy/disturbance within 6/10mi or 1 mi of leks from 3/1-5/15, 6pm-8am	5	43
A25b	for nests within 3mi of lek; avoid surface disturbance within 6/10mi or 1 mi from 3/1-5/15, 6pm-8am	5	43
A26	protect seedling sagebrush from big game / from big game & rabbits	1	44
	Excessive Sagebrush Canopy		
A27a	decrease sagebrush canopy through focused winter feeding in suitable habitat (sage-grouse)	1	45
A27b	seed desirable native forbs and cool-season grasses in suitable habitat (sage-grouse)	3	46
	Human Disturbance		
A28a	avoid new surface occupancy within 6/10mi of leks & disturbance within 6/10mi of leks from 3/1-5/15, 6pm-8ar	2	47
A28b	restrict surface disturbance activities within 3mi of leks from 3/1 - 6/15	1	47
A28c	limit noise to 10dBA above ambient measured at lek perimeter from 3/1 - 5/15, 6pm-8am	1	48
	Inappropriate / Poor Quality Reclamation		
A29a	seed disturbed and reclaimed areas with native seed mix	2	48
A29b	develop and field test seed mixes	5	49
A29c	develop and fund a custom grow program for sagebrush and forb seeds	8	49
A30a	separate topsoil during construction of facilities (operators)	4	50
A30b	obtain surface damage agreements that require topsoil separation (landowners)	4	51
A31	commit to appropriate wind & water erosion control above and beyond regulatory requirements	3	52
A32	sign surface damage agreements requiring invasive species control & reclaim with native seed mix	4	52
	Prescribed Fires		
A33a	avoid prescribed fires within 6mi of known leks and 1-1/4mi of known passerine habitat	3	53
A33b	use site-specific prescribed burn plans approved by TBGPEA within 6mi of leks, control invasives	8	53
	Roads		
A34a	implement annual dust control within suitable habitat	1	55
A34b	close roads and two tracks from 3/1 - 6/15 in suitable habitat	5	55
A34c	close roads and two tracks from 3/15 - 7/31 in suitable habitat	4	55
	C: Disease and Predation		
	Disease		
	West Nile Virus		
C1a	control mosquito larvae in > 75% of water impoundments within 5mi of leks or 3mi suitable habitat	4	56
C1b	control mosquito larvae by breaching, changing, or draining impoundments	2	57
C1c	control mosquito larvae by breaching impoundments and replacing with water well	3	57
C1d	control mosquito larvae by treating or draining all stock tanks not in use from 5/1 - 9/30	3	58
C1e	control mosquito larvae in tire storage areas or junkyards	2	58
C2a	build bat houses to encourage bat populations which aid in mosquito control	1	59
C2b	discourage mosquito overwintering and breeding in containers and woodpiles	3	59
	Predation		
C3a	remove or routinely burn existing dumps, landfills, or garbage piles within 4.3mi suitable habitat	2	60
C3b	utilize non-attractant waste disposal methods, particularly for areas within 4.3mi suitable habitat	3	60
C3c	remove brush piles and downed trees within 3mi of suitable habitat	3	60

Conservation Measures Sorted by Threat Factor

The below table is provided as a table of contents for the Conservation Measures described in detail following the table. The table is not intended to fully describe the requirements of each Conservation Measure.

Item	Factor / Area / Topic — Conservation Measures Summary	Point Value	Page
C3d	remove standing dead trees within 1mi of active leks	1	61
C3e	develop and disseminate public education material on methods to reduce sage-grouse predation	1	61
	D: Inadequacy of Existing Regulatory Mechanisms		
	Local Land Use Laws, Processes, and Ordinances		
	On- and Off-road Use of Suitable Habitat		
D1a	sign agreement that prevents recreational use during key sagebrush obligate life cycle activities	4	62
D1b	move livestock on horseback or on foot (restrict use of dogs) in suitable habitat	1	62
	Human Disturbance in Adjacent Near-lek Areas		
D2	minimize human disturbance within 3mi of leks from 3/1 - 6/15	2	63
	Recreational Lek Observations		
D3	manage lek viewing impacts by establishing lek viewing protocols	1	63
	Split Estate		
D4a	sign a cooperative management plan between surface and mineral rights owner	7	64
D4b	sign a cooperative management plan between grazing permittee & federal land management agency	7	65
	E: Other Natural or Manmade Factors Affecting the Species' Continued Existence		
	Drought		
	Damage to Existing Green Areas		
E1	reduce sedimentation on ephemeral draws by stabilizing head cuts in suitable habitat	1	65
	Lack of Suitable Water Availability		
E2a	establish guzzlers or other ground level watering sources	1	66
E2b	install and maintain TBGPEA approved wildlife escape ramps and livestock barriers	3	66
E2c	replace existing, poorly designed ramps and barriers with TBGPEA approved ramps and barriers	3	67
	Use of Insecticides		
E3a	commit to not using carbofuran insecticides	4	67
E3b	commit to RAATS for all insecticide spraying within CI or CI/CP area	6	68
	Lack of Education		
E4a	develop and fund two media spots describing conservation programs	1	68
E4b	work with Conservation Districts to sponsor two Small Acreage Workshops	1	69
E4c	develop and present sagebrush obligate related information in classrooms	1	69
E4d	develop material on impacts of fragmentation and benefits of weed control and provide to teachers	1	70
E4e	sponsor outreach activities for educators and their classes along with interested public	1	70

FACTOR A. The Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range.

Habitat Fragmentation and Destruction

Conversion of Suitable Habitat

A1 Sagebrush Steppe Threat: Modification of lands from wildfire, poorly reclaimed energy developments, and conversion of sagebrush habitat to agriculture use (including grassland monocultures) are primary sources of habitat fragmentation and degradation across the Coverage Area, especially in areas where suitably deep soils and adequate water are available. These and similar modifications have reduced known and potential habitat for nesting, brood-rearing, and/or wintering birds. Within the Coverage Area, most of the farming activity occurred during the 1920s and 1930s and a majority of these areas, along with natural wildfire scars, were poorly reclaimed, if they were reclaimed at all. This has created areas of fragmentation and degradation depending on the site.

A1 Sagebrush Steppe Conservation Measure A: Design and implement treatments to bring native sagebrush-grassland species to desired conditions on a collective 320 acres of disturbed lands utilizing appropriate tools (e. g. seeding, sagebrush plantings, grazing management, herbicide, etc.) [up to 6 points depending on proximity to lek, connectivity, and surrounding habitat conditions, up to 26 points if more than 1 life-cycle habitat is addressed (e.g., nesting / brood-rearing, late brood-rearing / winter, etc.)]

CI or CI/CP Information:

- Conduct baseline monitoring to determine existing conditions and compare to current guidelines (BLM Habitat Assessment Framework, etc.) for height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Specify details of selected treatment methods including control of invasive species if necessary
- Commit to implement and ensure success of sagebrush treatment

Performance Monitoring to Support Adaptive Management[1]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; provide monitoring data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[2] to verify treatment area trend

A1 Sagebrush Steppe Conservation Measure B: Commit to no additional conversion of sagebrush rangeland to cropland (including grassland monocultures such as crested wheat) on enrolled lands [1 - 6 points depending on

[1] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[2] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

the history of conversion and extent of cropland currently within the CI or CI/CP; 1 additional point if area is within 5 miles of an active sage-grouse lek]

CI or CI/CP Information:

- Map enrolled land configuration (sagebrush rangeland, cropland, crested wheat, etc.) specifying existing land use
- Document likelihood of changes in land configuration or use if not for the agreement to implement the Conservation Measure
- Commit to not convert additional sagebrush rangeland to cropland

Performance Monitoring to Support Adaptive Management:

- Map and report any changes in land configuration or use to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[3] to verify land use

A1 Sagebrush Steppe Benefits: Protection, establishment or reestablishment of native sagebrush-grassland plant communities will reduce fragmentation and/or degradation, thus increasing potential foraging, nesting, brood-rearing or other uses by sagebrush obligates. This will benefit nest establishment and success, brood rearing success, and/or winter use capacity.

Energy Development: Mining

A2 Sagebrush Steppe Threat: Sagebrush stands that meet mine bond release criteria for shrub density may not meet the optimal sagebrush density or canopy cover for sagebrush steppe habitat. This reduces potential habitat for nesting, brood-rearing, and/or winter use and is a lost opportunity to provide habitat that is better suited to sagebrush obligates.

A2 Sagebrush Steppe Conservation Measure: Increase and sustain the extent of sagebrush and forb mosaic re-establishment on mined land reclamation above the minimum required and approved acreage in the permit-to-mine. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent non-mined areas [2 points for every 100 percent increase above the minimum approved acreage, minimum 40 collective acres]

CI or CI/CP Information:

- Map increased areas of sagebrush/forb habitat to be established
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to increase sagebrush and forb mosaic re-establishment on mine lands as described and ensure success of re-establishment
- Establish 100' (or comparable) vegetation transects and photo points with GPS locations: 1 per project area, minimum of 1 per 160 acres

One-time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

[3] This frequency is based on the current update cycle of National Agriculture Imagery Program data

Performance Monitoring to Support Adaptive Management[4]:

- Establishing Trend (first 5 years): At each transect, monitor sagebrush height & vegetation cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor sagebrush height and vegetation cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Provide excerpt of DEQ report detailing increased sagebrush/forb area parameters
- Association staff will visit the site at least once every 4 years to verify habitat practices

A2 Sagebrush Steppe Benefits: Increasing the area and extent of sagebrush stands in coal mine reclamation increases the potential total sagebrush steppe habitat and increases the likelihood for reclamation use by sagebrush obligates for nesting, brood-rearing, and/or winter use.

A3 Sagebrush Steppe Threat: Use of non-native plant species for coal mine reclamation seeding of approved pasturelands in the postmine reclamation plan results in vegetation communities that are not conducive to sagebrush obligate use, and represent lost potential sagebrush steppe habitat. Non-native reclamation reduces the available habitat for nesting, brood-rearing, and/or winter use.

A3 Sagebrush Steppe Conservation Measure: Substitute native sagebrush grassland seed mix in lieu of re-establishing the post-mine improved pasture acreage allowed by the approved reclamation plans in the permit-to-mine. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [3 points for every 80 acres of improved pasture acreage seeded with a sagebrush-grassland mix]

CI or CI/CP Information:

- Map proposed areas of sagebrush grassland establishment
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to implement proposed seeding and ensure success of seeding
- Establish 100' (or comparable) vegetation transects and photo points with GPS locations: 1 per project area, minimum of 1 per 160 acres

One-time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[5]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP

[4] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C
[5] Ibid.

- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Provide excerpt of DEQ report detailing sagebrush grassland area parameters
- Association staff will visit the site at least once every 4 years to verify habitat practices

A3 Sagebrush Steppe Benefits: Forgoing the approved option to establish pastureland acreage in reclamation and instead reclaiming with native species will increase the quality of the reclamation for sagebrush obligates, thus increasing the likelihood for reclamation use by sagebrush obligates for nesting, brood-rearing, and/or winter use.

A4 Sagebrush Steppe Threat: Disturbances can create sagebrush habitat fragmentation and inhibit sagebrush obligate use and sage-grouse movement between undisturbed areas. Sage-grouse, particularly non-migratory populations, require extensive areas of habitat to allow movement and seasonal selection of habitat areas for breeding, brood-rearing, overwintering, etc.. Sagebrush obligates can abandon use of fragmented habitat and nesting and brood rearing success and/or winter use capacity is reduced.

A4 Sagebrush Steppe Conservation Measure: Incorporate landscape scale sagebrush obligate lifecycle needs into mine reclamation plans. This requires establishing connections between reclamation and surrounding native sagebrush areas and integrating sagebrush, grassland, and forb plantings with each other and with reclamation topography [6 points for integrated reclamation plan covering entire mine, minimum 640 contiguous acres]

CI or CI/CP Information:

- Identify and map suitable sagebrush steppe habitat and potential areas of connection to native habitat
- Provide portion of plan describing voluntary integrated habitat reclamation
- Commit to implementing integrated habitat reclamation

Performance Monitoring to Support Adaptive Management:

- Provide details of integrated habitat reclamation activities to the Association by January 31 of each year or as specified in the CI or CI/CP.
- Report sage-grouse use of area through pellet count surveys (include GPS track along with location and description of pellets) or other sagebrush obligate wildlife monitoring to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify reclamation efforts

A4 Sagebrush Steppe Benefits: Creating intact habitat blocks reduces habitat fragmentation and maintains or potentially increases nesting and brood rearing success and/or winter use capacity. Establishing planned habitat linkages within reclaimed areas will increase the movement of sage-grouse between use areas. It will also increase the habitat use capacity by effectively minimizing fragmentation factors and essentially increasing the habitat tract boundaries. This increases the likelihood that sagebrush obligates will use the larger undisturbed areas for nesting, brood-rearing, and/or winter use.

Energy Development: Non-renewable

A5 Sagebrush Steppe Threat: High density oil and gas facilities can contribute to habitat fragmentation. Sagebrush obligates can abandon use of fragmented habitat and nesting and brood rearing success and/or winter use capacity is reduced.

A5 Sagebrush Steppe Conservation Measure: Limit surface disturbance (including existing disturbance) to 5 percent or less of suitable sagebrush steppe habitat per 640 acres in non-core areas by reducing drill site area and density through multi-well drilling pads, directional drilling, consolidated pipeline/road/utility corridors, closed loop drilling mud recovery systems, or other appropriate methods [9 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map suitable sagebrush steppe habitat and existing surface disturbance areas
- Specify details of activities selected to limit surface disturbance
- Commit to limit surface disturbance (including existing disturbance) to 5 percent or less of suitable sagebrush steppe habitat per 640 acres.
- Document current drill site size, drilling density, and likelihood of new oil and gas facilities if not for the agreement to implement the Conservation Measure

Performance Monitoring to Support Adaptive Management:

- Map new disturbance and report activities to limit surface disturbance to the Association by January 31 of each year or as specified in the CI or CI/CP
- Provide 1 photograph for each type of activity to limit surface disturbance annually; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify use of activities to limit surface disturbance

A5 Sagebrush Steppe Benefits: Reducing the disturbance footprint and resulting habitat fragmentation due to high density oil and gas facilities will protect intact habitat blocks and habitat connectivity. This will maintain and potentially increase nesting and brood rearing success and/or improve winter use capacity.

A6 Sagebrush Steppe Threat: Oil and gas well pad establishment can contribute to habitat loss and fragmentation as they often remove sagebrush habitat. Unless multi-well pads are used, habitat impact increases with well pad size as the larger the pad the greater the habitat removed. Reduced or fragmented sagebrush steppe habitat results in reduced nest establishment and success, reduced brood-rearing success, and/or reduced winter capacity.

A6 Sagebrush Steppe Conservation Measure A: Commit to multi-well pads or new well pad areas in sagebrush habitat that average less than 80 percent of average pre-Agreement pad size [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document current average drill site size, drilling density, and likelihood of new oil and gas facilities if not for the agreement to implement the Conservation Measure
- Commit that all new wells constructed will be multi-well pads or average less than 80 percent of average pre-Agreement pad size

Performance Monitoring to Support Adaptive Management:

- Map and report new drill site size for each well along with drilling density to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[6] to verify drill site size and drilling density

A6 Sagebrush Steppe Conservation Measure B: Commit to utilizing drill pad mats on all level sites in suitable sagebrush habitat [5 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document likelihood of new oil and gas facilities if not for the agreement to implement the Conservation Measure
- Commit to use drill pad mats on all suitable sites in sagebrush habitat

Performance Monitoring to Support Adaptive Management:

- Map and report mat implementation details (drill site size, mat dimensions, and deployment methodologies, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Photograph at least 1 area where drill pad mats were utilized during the year; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify drill pad mat utilization

A6 Sagebrush Steppe Benefits: Reducing well pad size or impact, with corresponding reduced habitat loss from current practices, will result in increased sagebrush obligate use capacity. This will favorably affect nest establishment and success, brood rearing success, and/or winter capacity.

Facilities: Detrimental Siting Due to Lack of Information

A7 Sagebrush Steppe Threat: Lack of information on sagebrush obligate use areas and/or sagebrush habitat can result in inadvertent fragmentation from placement of roads, power lines, fences, or other detrimental infrastructure within critical distances of suitable sagebrush steppe habitat. This can cause sagebrush obligates to use marginal habitats resulting in reduced success in nest establishment, brood survivorship, and/or winter survivorship.

A7 Sagebrush Steppe Conservation Measure A: Collect information necessary to maintain and update sagebrush steppe habitat maps and report to the Association at least annually. This information includes recording GPS locations of incidental sightings and conducting 1/2 mile of sage-grouse pellet counts in each pasture within 6 miles of Occupied Sage-grouse Leks. Where applicable, the participating member will utilize this information for surface use purposes to avoid new habitat fragmentation and/or remove existing infrastructure that may cause habitat fragmentation. The Association will report this information to appropriate agencies annually [3 points for entire CI or CI/CP area, additional points are possible if identified habitat use areas are permanently protected from fragmentation through a conservation easement]

CI or CI/CP Information:

- GPS location of existing sage-grouse leks and map of known sagebrush obligate use areas
- Identify pastures where pellet counts will be conducted

[6] This frequency is based on the current update cycle of National Agriculture Imagery Program data

- Commit to collect information necessary to maintain and update sagebrush steppe habitat maps for covered species and report data to the Association at least annually. This information includes recording GPS locations of incidental sightings and conducting 1/2 mile of sage-grouse pellet counts in each pasture within 6 miles of Occupied Sage-grouse Leks.
- Commit to utilize this information for surface use purposes to avoid new fragmentation of sagebrush habitat and/or remove existing infrastructure that may cause habitat fragmentation where applicable.

Reporting Requirements:

- GPS location of incidental sightings of covered species including number of birds or provide comprehensive wildlife surveys; report to the Association after each sighting or no later than January 31 of each year or as specified in the CI or CI/CP
- GPS track of sage-grouse pellet survey route including location and description of pellets; report to the Association after each survey or no later than January 31 of each year or as specified in the CI or CI/CP
- Document how information was utilized for surface use purposes; report to the Association by January 31 of each year or as specified in the CI or CI/CP

A7 Sagebrush Steppe Conservation Measure B: Conduct sage-grouse collaring studies, daily lek usage studies, nesting studies, genetic testing, resource selection functions, environmental analysis, or other studies necessary to maintain and update sagebrush obligate life cycle information and habitat use maps. Where applicable, the participating member will utilize this information to avoid new habitat fragmentation and/or remove existing infrastructure that may cause habitat fragmentation. The Association will report this information to appropriate agencies annually and will attempt to publish pertinent information in a timely manner [4 points per annual study, depending on study parameters; additional points are possible if identified habitat use areas are permanently protected from fragmentation through a conservation easement]

CI or CI/CP Information:

- GPS location of existing sage-grouse leks and map of known sagebrush obligate use areas
- Identify study parameters (location, timing, objectives, etc.)
- Commit to conduct sage-grouse collaring studies, daily lek usage studies, nesting studies, genetic testing, resource selection functions, environmental analysis, or other studies necessary to maintain and update sagebrush obligate life cycle information and habitat use maps.
- Commit to avoid new habitat fragmentation and/or remove existing infrastructure that may cause habitat fragmentation where applicable

Reporting Requirements:

- Participating member will provide a summary report of studies to the Association by January 31 of each year or as specified in the CI or CI/CP
- A complete final report which includes all collected data will be provided to the Association within 90 days of project completion
- Document how information was utilized for surface use purposes; report to the Association by January 31 of each year or as specified in the CI or CI/CP

A7 Sagebrush Steppe Benefits: Active collection of sagebrush obligate use and sagebrush habitat information will reduce fragmentation of suitable habitat by increasing the identification of suitable habitats, allowing for better planning, maintenance, and conservation of these areas. The Association will use this information to update and disseminate habitat maps to its members, thereby reducing the potential for placement of

infrastructure in or near suitable sagebrush steppe habitats. This will improve the potential for nesting and brood-rearing success and/or capacity of winter habitat.

Facilities: High Profile and Vertical Structures

A8 Sage-grouse Threat: High-profile, above-ground facilities and vertical structures (such as power lines, substations, guy wires, compressor stations, storage tanks, and communication towers) reduce suitability of sage-grouse habitat. Sage-grouse avoid these facilities causing reduced use or abandonment of suitable seasonal sage-grouse habitats. This can reduce sage-grouse lek attendance and even cause leks to be abandoned. For example, power line avoidance by sage-grouse could force the birds away from prime brood-rearing habitat into marginal habitat resulting in reduced brood survivorship rates and reducing the overall population recruitment. Additionally, above-ground facilities can cause sage-grouse injuries or fatalities from direct collisions.

A8 Sage-grouse Conservation Measure A: Avoid siting facilities or vertical structures within 6/10 mile of sage-grouse leks [2 points for each lek; 2 additional points for expanding facility avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek locations
- Commit to avoid siting facilities or vertical structures within 6/10 mile of sage-grouse leks
- Document likelihood of new facilities or vertical structures if not for the agreement to implement the Conservation Measure

Performance Monitoring to Support Adaptive Management:

- Map any new facilities or vertical structures within 6/10 or 1 mile of sage-grouse leks; report new facilities or submit a "no new facilities/vertical structures" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- For each new facility or vertical structure, provide before and after digital photographs taken from the same location, along with GPS coordinates of each photo point, to the Association by January 31 or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[7] to verify siting of facilities and vertical structures

A8 Sage-grouse Conservation Measure B: Within 6/10 mile of sage-grouse leks, commit to reducing existing high-profile, above-ground facilities and vertical structures by undertaking activities such as burying power lines whenever possible, removing vertical structures such as abandoned buildings and power poles, etc. [1 point for each lek within the CI or CI/CP area; 1 additional point for expanding facility reduction radius to 1 mile]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek locations and map Suitable Sage-grouse Habitat
- Map existing facilities and vertical structures within 6/10 or 1 mile of sage-grouse leks
- Identify facility and/or structure removal plan and timeline
- Commit to reduce existing high-profile, above ground facilities and vertical structures

[7] This frequency is based on the current update cycle of National Agriculture Imagery Program data

Performance Monitoring to Support Adaptive Management:

- Provide facility and/or vertical structure removal progress report and before and after digital photographs taken from the same location of each removed facility or vertical structure, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will utilize aerial imagery (NAIP or comparable) at least once every 3 years[8] until removal plan is complete to verify facility and/or structure removal

A8 Sage-grouse Conservation Measure C: Avoid siting high-profile, above-ground facilities and vertical structures within Suitable Sage-grouse Habitat [up to 5 points for entire CI or CI/CP area depending on acreage and habitat quality]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek locations and map Suitable Sage-grouse Habitat
- Document likelihood of new facilities or vertical structures if not for the agreement to implement the Conservation Measure
- Commit to avoid siting facilities within suitable habitat

Performance Monitoring to Support Adaptive Management:

- Report new facilities and vertical structures or submit a "no new facilities/vertical structures" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- If a new facility or vertical structure is constructed during the year, provide before and after digital photographs taken from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will utilize aerial imagery (NAIP or comparable) at least once every 3 years[9] to verify absence of high-profile, above-ground facilities and vertical structures

A8 Sage-grouse Conservation Measure D: Within suitable habitat, commit to reducing high-profile, above-ground facilities and vertical structures by undertaking activities such as burying power lines whenever possible, removing vertical structures such as abandoned buildings and power poles, siting facilities to limit raptor use. etc. [up to 5 points for entire CI or CI/CP area depending on acreage and habitat quality]

CI or CI/CP Information:

- Identify and GPS existing facility and vertical structure locations
- Specify selected activities to reduce facilities and vertical structures
- Commit to reduce existing high-profile, above ground facilities and vertical structures

Performance Monitoring to Support Adaptive Management:

- Map and report activities to reduce facilities and vertical structures employed during the year to the Association by January 31 of each year or as specified in the CI or CI/CP
- Photograph each employed activity to reduce facilities and vertical structures; provide before and after digital photograph(s) taken from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will utilize aerial imagery (NAIP or comparable) at least once every 3 years[10] to verify use of activities to reduce high-profile, above-ground facilities and vertical structures

[8] Ibid.
[9] Ibid.

A8 Sage-grouse Benefits: Reducing the number of high-profile facilities or vertical structures in sage-grouse habitat will reduce sage-grouse lek and other suitable habitat impacts, and risk of direct sage-grouse mortality from raptor predation. This will maintain or increase use of Suitable Sage-grouse Habitats, thus improving the potential for nesting and brood-rearing success and/or capacity of winter habitat.

Fences

A9 Sage-grouse Threat: Fences cause habitat fragmentation and provide potential travel corridors for predators. Also, research has shown that sage-grouse can fly into poorly located fences causing direct injury or mortality. Additionally, wooden fence posts provide potential perch sites from which raptors can hunt for sage-grouse.

A9 Sage-grouse Conservation Measure A: Selectively remove fences near sage-grouse leks and in Suitable Sage-grouse Habitat to decrease fragmentation [1 point per 1/4 mile, maximum of 6 points]

CI or CI/CP Information:

- Identify and map sage-grouse leks and Suitable Sage-grouse Habitat
- Map existing fences
- Indicate fences that will be removed
- Commit to remove identified fences

One-time Compliance Monitoring:

- Report amount of fence removed to the Association by January 31 of each year or as specified in the CI or CI/CP
- For each contiguous section of removed fence, provide before and after digital photographs taken from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit site or use aerial imagery (NAIP or comparable) at least once 6 years to verify status of fence removal

A9 Sage-grouse Conservation Measure B: Mark fences to reduce risk of collision by sage-grouse [1 point per 1/4 mile, maximum of 6 points]

CI or CI/CP Information:

- Map existing fences
- Indicate fences that will be marked
- Commit to mark identified fences

One-time Compliance Monitoring:

- Report amount of fence marked to the Association by January 31 or as specified in the CI or CI/CP
- For each contiguous section of marked fence, provide before and after digital photographs taken from the same location, along with GPS coordinates of each photo point, to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit the site at least once every 4 years to verify status of fence marking

[10] This frequency is based on the current update cycle of National Agriculture Imagery Program data

A9 Sage-grouse Conservation Measure C: Commit to siting new fences 6/10 mile or more outside of sage-grouse leks or other Suitable Sage-grouse Habitat using proven methods to limit raptor use. Mark fences as necessary [1 point for entire CI or CI/CP area; 1 additional point for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify and map sage-grouse leks and Suitable Sage-grouse Habitat
- Document likelihood of new fences if not for the agreement to implement the Conservation Measure
- Commit to site new fences 6/10 mile or more outside of sage-grouse leks or other Suitable Sage-grouse Habitat
- Indicate selected method to limit raptor use

One-time Compliance Monitoring:

- Map any new fences and report to the Association by January 31
- Provide documentation (invoice, etc.) that non-wooden line posts were used to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Map new fences within 6/10 or 1 mile of sage-grouse leks or other Suitable Sage-grouse Habitat; report changes or submit a "no new fence" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify status of fence marking or will utilize aerial imagery (NAIP or comparable) at least once every 6 years to verify fence status

A9 Sage-grouse Benefits: These measures will reduce habitat fragmentation and the risk of direct mortality from fence collisions, from predators using the fence lines as travel corridors, and/or from raptors using the fences as perch sites to hunt sage-grouse. These measures will provide the potential for increased survival rates of the sage-grouse population.

Fragmentation: General

A10 Sagebrush Steppe Threat: Disturbances can create sagebrush habitat fragmentation and inhibit sagebrush obligate use and sage-grouse movement between undisturbed areas. Sage-grouse, particularly non-migratory populations, require extensive areas of habitat to allow movement and seasonal selection of habitat areas for breeding, brood-rearing, overwintering, etc.. Sagebrush obligates can abandon use of fragmented habitat and nesting and brood rearing success and/or winter use capacity is reduced.

A10 Sagebrush Steppe Conservation Measure A: Obtain or donate conservation easements with a minimum 10 year term (term must match or exceed the CI or CI/CP term) for intact habitat to be managed specifically for sagebrush obligates [8 points for each 320 contiguous acres]

CI or CI/CP Information:

- Identify proposed conservation easement participants and provide map

One-time Compliance Monitoring:

- Commit to obtain or donate conservation easement within 5 years of CI or CI/CP signing
- Submit a signed copy of the conservation easement to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- If the conservation easement is obtained and managed by the participating member, report any actions taken during the year to ensure protection of intact habitat and any specific management actions taken during the year to benefit sagebrush obligates to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify habitat protection and management actions

A10 Sagebrush Steppe Conservation Measure B: Obtain or provide acreage for use as a grass bank with a minimum 10 year term (term must match or exceed CI or CI/CP I term). This acreage will be used to facilitate and better manage habitat restoration efforts (e.g., understory development, invasive species control, drought management, etc.) occurring throughout the Coverage Area. Participating members will be able to use the grass bank acreage in return for providing rest on their property equal to 120 percent of their grass bank acreage use. A deferred-rotation or rest-rotation grazing schedule will be developed for the grass bank as well, to ensure sagebrush steppe habitat development in the event this habitat type occurs in the grass bank acreage [5 points for each 320 contiguous acres]

CI or CI/CP Information:

- Identify proposed grass bank acreage and provide map
- Commit to obtain or provide acreage for grass bank
- Identify deferred-rotation or rest-rotation grazing schedule/parameters
- Location of grass bank acreage must be approved by the Association Board

One-time Compliance Monitoring:

- Obtain or donate grass bank acreage within 5 years of CI or CI/CP signing
- Submit a signed copy of the grass bank agreement to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will annually determine appropriate stocking rates utilizing the Grazing Response Index or other monitoring tools, and coordinate with Association members to ensure grass bank acreage is used appropriately
- Association staff will visit the site at least once every 4 years to verify habitat protection and management actions

A10 Sage-grouse Conservation Measure C: Protect, enhance, or restore habitat linkages between 320 acre minimum blocks of Suitable Sage-grouse Habitat. Although no research was found to support specific widths, to be conservative, this measure requires linkage widths to be at least 50 feet for blocks less than 1/4 mile apart and at least 100 feet for blocks 1/4 mile or more apart [2 points for entire CI or CI/CP habitat, 2 additional points for Occupied Sage-grouse Habitat]

CI or CI/CP Information:

- Identify and map Suitable Sage-grouse Habitat
- Map habitat linkages
- Commit to protect, enhance, or restore habitat linkages
- Establish baseline photo points with GPS locations: 1 per linkage corridor

Performance Monitoring to Support Adaptive Management:

- For each established photo point, photograph linkage corridors annually within ± 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sage-grouse use of linkage corridors through pellet count surveys (include GPS track along with location and description of pellets) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify habitat linkages

A10 Sagebrush Steppe Benefits: Protecting intact habitat blocks reduces habitat fragmentation and maintains or potentially increases nesting and brood rearing success and/or winter use capacity. Establishing planned habitat linkages within disturbed or reclaimed areas will increase the movement of sage-grouse between use areas. It will also increase the habitat use capacity by effectively minimizing fragmentation factors and essentially increasing the habitat tract boundaries. This increases the likelihood that sagebrush obligates will use the larger undisturbed areas for nesting, brood-rearing, and/or winter use.

Fragmentation: Brewer's Sparrow

A11 Brewer's Sparrow Threat: The potential loss or fragmentation of suitable sagebrush habitat is considered to be the principal threat to Brewer's sparrow populations. Quality Brewer's sparrow breeding habitat includes large shrublands with sagebrush cover in the 25 to 40 percent range, a shrub canopy height less than 5 feet, numerous available shrubs less than 3 feet in height in the interior of the shrubland and low or absent Russian thistle cover. Given these parameters, any fragmentation or modification of existing conditions that meet these criteria, or actions that preclude them from becoming established are threats to Brewer's sparrow populations. Such actions reduce the number of nests and/or nest success of Brewer's sparrows.

A11 Brewer's Sparrow Conservation Measure A: Map and protect sagebrush stands that contain areas of dense shrubs with 25 to 40 percent shrub cover, general shrub heights of 5 feet or less and significant numbers of live shrubs with heights less than 3 feet [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suitable Brewer's sparrow habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by Brewer's sparrow
- Identify and commit to implement protection measures, which may include restricting fragmentation, modifying grazing, and removing nearby attractants, etc.
- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report Brewer's sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP

- Association staff will visit the site at least once every 4 years[11] to verify treatment area trend

A11 Brewer's Sparrow Conservation Measure B: Delineate and protect sagebrush stands or other shrub stands with known Brewer's sparrow breeding activity [3 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map known Brewer's sparrow nesting habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by Brewer's sparrow
- Identify protection measures
- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report Brewer's sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[12] to verify treatment area trend

A11 Brewer's Sparrow Conservation Measure C: Identify and enhance suboptimal sagebrush stands to create stands with general shrub heights in the 1.5 to 5 feet range and numerous individual robust live plants less than 3 feet in height [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suboptimal sagebrush habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by Brewer's sparrow
- Identify enhancement measures
- Commit to implement enhancement measures

Performance Monitoring to Support Adaptive Management[13]:

- Establishing Trend of each enhancement measure (first 5 years): At each transect, monitor shrub species height & cover by shrub species and take 1 digital photograph along transect annually during growing season; report to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP

[11] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

[12] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

[13] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

- Report Brewer's sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[14] to verify habitat parameters

A11 Brewer's Sparrow Conservation Measure D: Delineate areas of Russian thistle dominance within or adjacent to active Brewer's sparrow habitat; treat the Russian thistle and replace with sagebrush cover in the range of 25 to 40 percent, reporting success-failure to the Association, and redoing failed seeding until successful as compared to adjacent areas [2 points for a collective 320 acres]

CI or CI/CP Information:

- Identify and map active Brewer's sparrow habitat and areas of Russian thistle
- Conduct baseline vegetation monitoring: cover by shrub species and Russian thistle, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by Brewer's sparrow
- Identify treatment methods, pure live seed rate, etc.
- Commit to implement treatment measures

One time Compliance Monitoring:

- Report treatment details (map of treatment area, acres covered, spray equipment used, chemicals used, wind speed & direction, temperature, relative humidity, etc.) to the Association by January 31 or as specified in the CI or CI/CP
- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[15]:

- Establishing Trend (first 5 years): At each transect, monitor Russian thistle and shrub species height & cover by Russian thistle and shrub species and take 1 digital photograph along transect annually during growing season; report data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report Brewer's sparrow use of treatment areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[16] to verify treatment area trend

A11 Brewer's Sparrow Benefits: Protection, establishment, or reestablishment of sagebrush stands that meet the Brewer's sparrow nesting habitat criteria will reduce fragmentation and increase available habitat, thus benefiting nest establishment, nesting success, brood rearing success, and overall population recruitment.

[14] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

[15] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[16] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

Fragmentation: Sagebrush Sparrow

A12 Sagebrush Sparrow Threat: Since sagebrush sparrows nest in large shrub patches of 320 contiguous acres[17], the species is particularly vulnerable to fragmentation, reduction of the extent of existing shrub patches, and to any shrub clearing actions. Additionally, the species is known to favor sagebrush patches for habitat, particularly patches that contain relatively evenly spaced sagebrush plants ranging from 2 to 6 feet in height. Range modifications that diminish those conditions, or preclude their development, consequently degrade sagebrush sparrow habitat. Prime nesting sites are considered to be vigorous sagebrush plants 2 to 6 feet in height that contain more than 75 percent live material. Any shrub stand modifications that eliminate or reduce these conditions constitute a threat to sagebrush sparrow nesting habitat. Actions that disturb or modify existing habitat that meets the above criteria, or preclude development of shrub stands with those criteria, reduces the number of nests or nest success of sagebrush sparrow.

A12 Sagebrush Sparrow Conservation Measure A: Map and protect sagebrush stands that contain vigorous[18] sagebrush plants with the majority ranging from 2 to 6 feet in height [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suitable sagebrush sparrow habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sagebrush sparrow
- Identify protection measures
- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sagebrush sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[19] to verify treatment area trend

A12 Sagebrush Sparrow Conservation Measure B: Delineate and protect sagebrush stands or other shrub stands with known sagebrush sparrow breeding activity [3 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map known sagebrush sparrow breeding habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sagebrush sparrow
- Identify protection measures

[17] Paige & Ritter (1999)

[18] A majority of plants should consist of greater than 75% live material

[19] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sagebrush sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[20] to verify habitat protection

A12 Sagebrush Sparrow Conservation Measure C: Identify and enhance suboptimal sagebrush stands to create vigorous stands with heights in the 2 to 6 feet range [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suboptimal sagebrush habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sagebrush sparrow
- Identify enhancement measures
- Commit to implement enhancement measures

Performance Monitoring to Support Adaptive Management[21]:

- Establishing Trend of enhancement measures (first 5 years): At each transect, monitor shrub species height & cover by shrub species and take 1 digital photograph along transect annually during growing season; report monitoring data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sagebrush sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[22] to verify habitat parameters

A12 Sagebrush Sparrow Conservation Measure D: Through plantings and/or acceptable husbandry practices, establish in-fill or peripheral areas of sagebrush to expand areas of known sagebrush sparrow habitat that have 320 contiguous acres or more of shrub stand that contains vigorous sagebrush with the majority ranging from 2 to 6 feet in height. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map active sagebrush sparrow habitat and potential in-fill or peripheral areas
- Conduct baseline monitoring: cover by shrub species, shrub species height

[20] Ibid.

[21] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[22] This frequency is adapted from on WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum 1 per 160 acres
- Report any observed use by sagebrush sparrow
- Identify treatment methods, pure live seed rate, etc.
- Commit to implement treatment methods

One time Compliance Monitoring:

- Report details of treatment (acres covered, method used, etc.) to the Association by January 31 or as specified in the CI or CI/CP
- Map seeded; report seeding efforts (invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[23]:

- Establishing Trend (first 5 years): At each transect, monitor shrub species height & cover by shrub species and take 1 digital photograph along transect annually during growing season; report monitoring data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sagebrush sparrow use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[24] to verify habitat parameters

A12 Sagebrush Sparrow Benefits: Protection, establishment, or reestablishment of sagebrush stands that meet the sagebrush sparrow nesting habitat criteria will reduce fragmentation and increase available habitat, thus benefiting nest establishment, nesting success, brood rearing success, and overall population recruitment.

Fragmentation: Sage Thrasher

A13 Sage Thrasher Threat: Although sage thrashers have been observed utilizing marginal habitats with less than 5 percent shrub cover, quality sage thrasher habitat consists of 320 acre or larger sagebrush-grassland areas having 10 to 30 percent shrub cover with at least 15 percent of the shrubs with heights in the range of 1 to 2 feet and inclusion of dense clumps of large sagebrush plants that exceed 40 inches in height. Given these parameters, any fragmentation or modification of existing conditions that meet these criteria or actions that preclude their development, are threats to sage thrasher populations. Such actions reduce the number of nests and/or nest success of sage thrashers.

A13 Sage Thrasher Conservation Measure A: Map and protect sagebrush stands that have shrub cover greater than 15 percent, general shrub heights in the 1 to 2 foot range and with significant clumps of larger sagebrush plants that have heights in excess of 40 inches [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suitable sage thrasher habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height

[23] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[24] This frequency is adapted from on WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sage thrasher
- Identify protection measures
- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sage thrasher use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[25] to verify treatment area trend

A13 Sage Thrasher Conservation Measure B: Delineate and protect sagebrush stands or other shrub stands with known sage thrasher breeding activity [3 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map known sage thrasher breeding habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sage thrasher
- Identify protection measures
- Commit to implement protection measures

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sage thrasher use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[26] to verify habitat protection

A13 Sage Thrasher Conservation Measure C: Identify and enhance suboptimal sagebrush stands to create stands with general shrub heights in the 12 to 24 inch range with a component of sagebrush plants with heights greater than 40 inches [2 points for each contiguous 320 acres]

CI or CI/CP Information:

- Identify and map suboptimal sagebrush habitat
- Conduct baseline monitoring: cover by shrub species, shrub species height
- Report information along with GPS location of established 100' (or comparable) shrub transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Report any observed use by sage thrasher
- Identify enhancement measures
- Commit to implement enhancement measures

[25] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

[26] This frequency is adapted from on WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

Performance Monitoring to Support Adaptive Management[27]:

- Establishing Trend of enhancement measures (first 5 years): At each transect, monitor shrub species height & cover by shrub species and take 1 digital photograph along transect annually during growing season; report to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually during growing season. Monitor shrub species height and cover by shrub species every 5th year. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report sage thrasher use of protected areas by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[28] to verify habitat parameters

A13 Sage Thrasher Benefits: Protection, establishment, or reestablishment of sagebrush stands that meet the sage thrasher nesting habitat criteria will reduce fragmentation and increase available habitat, thus benefiting nest establishment, nesting success, brood rearing success, and overall population recruitment.

Inappropriate Livestock and Wildlife Grazing Management

A14 Sagebrush Steppe Threat: Inappropriate grazing management (especially during drought) can reduce beneficial forbs and cool-season bunchgrasses which are used by sagebrush obligates for both screening cover and forage. Reduction in perennial grass cover may also cause an area to be more susceptible to invasive species such as cheatgrass. Cheatgrass is especially detrimental as it not only destroys habitat but can increase the risk of extensive wildfires. Inappropriate grazing can degrade sagebrush steppe habitat resulting in reduced nesting and brood-rearing success and/or use as winter habitat.

A14 Sagebrush Steppe Conservation Measure A: Develop and follow an Association approved Grazing Management Plan throughout the CI or CI/CP term which provides high (≥6 inches) structure on a minimum of 5 percent of enrolled acres during the term of the CI or CI/CP and incorporates management objectives for sagebrush steppe habitat and drought/post-drought mitigation. The Grazing Management Plan will include deferment or rotation elements, providing at least cool-season (May 1 - June 30) rest for one out of every three years, and an average of 30 percent annual utilization [7 points for initial 5 percent, 2 points each additional 1 percent of enrolled acres covered]

CI or CI/CP Information:

- Specify details of selected management plans (covered acres, deferral/rest periods, rotation objectives, drought/post-drought mitigation plan, wildlife objectives, etc.); consult with NRCS, UW Extension as necessary
- Commit to implement selected management plan

Performance Monitoring to Support Adaptive Management:

- Report plan details (livestock numbers, in/out dates, supplemental forage for each covered pasture, anticipated plan modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to discuss management plan implementation, current year objectives, and anticipated plan modifications

[27] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[28] This frequency is adapted from on WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

A14 Sagebrush Steppe Conservation Measure B: Sponsor an Association approved grazing management plan throughout the CI or CI/CP term which provides high structure for a minimum of 5 percent of sponsor's enrolled acres during the term of the CI or CI/CP and incorporates management objectives for sagebrush steppe habitat and drought/post-drought mitigation. This can take the form of managed grass bank acres, agreements with other members to provided additional acreage above their minimum requirements, or other voluntary, cooperative Conservation Measures. The grazing plan will include deferment or rotation elements, providing at least cool-season (May 1 - June 30) rest for one out of every three years, and an average of 30 percent annual utilization [8 points for initial 5 percent, 2 points each additional 1 percent of enrolled acres covered]

CI or CI/CP Information:

- Specify details of selected management plans (covered acres, deferral/rest periods, rotation objectives, drought/post-drought mitigation plan, wildlife objectives, etc.); consult with NRCS, UW Extension as necessary
- Commit to implement selected management plan

Performance Monitoring to Support Adaptive Management:

- Report plan details (livestock numbers, in/out dates, supplemental forage for each covered pasture, anticipated plan modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to discuss management plan implementation, current year objectives, and anticipated plan modifications

A14 Sagebrush Steppe Conservation Measure C: Develop and follow an Association approved, CI- or CI/CP-wide, Grazing Management Plan throughout the CI or CI/CP term incorporating management objectives to improve or maintain sagebrush steppe habitat and drought/post-drought mitigation [up to 10 points, depending on habitat, up to 26 points if more than 1 life-cycle habitat is addressed (e.g., nesting / brood-rearing, late brood-rearing / winter, etc.)]

CI or CI/CP Information:

- Specify details of selected management plans (deferral/rest periods, rotation objectives, drought/post-drought mitigation plan, wildlife objectives, etc.); consult with NRCS, UW Extension as necessary
- Commit to implement selected management plan

Performance Monitoring to Support Adaptive Management:

- Report plan details (livestock numbers, in/out dates, supplemental forage for each covered pasture, anticipated plan modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to discuss management plan implementation, current year objectives, and anticipated plan modifications

A14 Sagebrush Steppe Conservation Measure D: Place attractants (salt, mineral, supplements, fly rubs, etc.) and disturbances (e.g., stock tanks, branding areas, etc.) in upland locations which minimize impacts to sagebrush steppe habitat [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map suitable sagebrush steppe habitat areas
- Identify sites where attractants can be located and GPS each location or provide a shapefile
- Commit to minimize impacts to sagebrush steppe habitat by placing attractants and disturbances in identified locations

Performance Monitoring to Support Adaptive Management:

- Report locations of attractants to the Association by January 31 of each year or as specified in the CI or CI/CP.
- Association staff will visit the site at least once every 4 years to verify attractant location

A14 Sagebrush Steppe Conservation Measure E: Manage wildlife numbers and associated habitat conditions in important sagebrush steppe habitat through the use of controlled public hunting access. Utilize focused wildlife hunting, enrollment of CI or CI/CP acreage in hunter management areas, use of walk-in area programs administered by WY Game & Fish Department, or other methods to help control wildlife numbers [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map important sagebrush steppe habitat areas
- Specify details of selected wildlife management efforts (covered acres, management type and objectives, etc.); consult with WGFD, UW Extension as necessary
- Commit to implement selected wildlife management efforts

Performance Monitoring to Support Adaptive Management:

- Report details (estimate of wildlife numbers, anticipated modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to discuss wildlife management implementation, current year objectives, and anticipated modifications

A14 Sagebrush Steppe Benefits: Appropriate grazing management of both livestock and wildlife and siting of attractants will reduce loss of forb and perennial grass (especially bunchgrass) components which are necessary for functional sagebrush steppe habitat. Additional forb production will improve sage-grouse brood-rearing habitat, benefiting both adult females and their broods. Increased bunchgrass vigor will improve screening cover leading to increased nest success. Improved perennial grass health will also make the area more resistant to invasion by undesirable annual species such as cheatgrass.

A15 Sage-grouse Threat: Reduction in screening cover through post-growing season grazing can increase sage-grouse nest predation leading to increases in direct mortality and declines in nest success.

A15 Sage-grouse Conservation Measure: Manage for greater than 6” residual vegetative height from April 1 to June 15 in sage-grouse nesting habitat areas [8 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map sage-grouse nesting areas
- Specify details of selected management plan - rest and recovery periods, rotation objectives; consult with NRCS, UW Extension as necessary
- Commit to implement management plan

Performance Monitoring to Support Adaptive Management:

- Report details (livestock numbers, in/out dates, supplemental forage for each covered pasture, anticipated plan modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP

- Conduct at least three step-pace transects between March 1 to April 15 to verify residual vegetative height; report results to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to discuss management plan implementation, current year objectives, and anticipated plan modifications

A15 Sage-grouse Benefits: Managing for appropriate screening cover will help reduce predation leading to increases in nest success and decreases in direct mortality.

Invasive Species

A16 Sagebrush Steppe Threat: Invasive species can reduce or eliminate sagebrush steppe habitat by providing perch sites (invasive trees) and displacing beneficial forbs and perennial grasses which are used for forage and screening cover. Cheatgrass is especially detrimental as it not only destroys habitat but also increases the risk of wildfires by providing a highly flammable fuel source leading to larger and hotter fires. Depending on the extent and intensity of the fire, significant areas of habitat can be fragmented or rendered unsuitable either through direct habitat destruction or by making the burned area more prone to repeat invasions by cheatgrass. This can cause sagebrush obligates to move into more marginal habitats resulting in reduced nesting and brood-rearing success and/or capacity of winter habitat.

A16 Sagebrush Steppe Conservation Measure A1: Treat annual bromes (cheatgrass) with imazapic or other herbicide / methods approved by the Association within a contiguous block area of at least 160 acres, or 10 percent of landholdings if area is less than 1,000 acres, in order to maximize treatment effectiveness and reduce edge recruitment of cheatgrass. Treatments will utilize localized methodology developed by the Association including post treatment grazing management. Report success-failure to the Association and repeat treatment as necessary [4 points for 320 acres]

CI or CI/CP Information:

- Map suitable sagebrush steppe habitat areas
- Conduct baseline vegetation monitoring: height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Identify treatment areas
- Indicate herbicide application parameters or other treatment methods
- Commit to treat identified areas as described and ensure success of treatment

One time Compliance Monitoring:

- Report details of treatment (map of treated area, acres covered, spray equipment used, chemicals used, wind speed & direction, temperature, relative humidity, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[29]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; provide monitoring data to the Association by January 31 of each year or as specified in the CI or CI/CP

[29] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association will visit the site at least once every 4 years to verify treatment performance

A16 Sagebrush Steppe Conservation Measure A2: In addition to treating cheatgrass as described in Conservation Measure A1 above, prepare and reseed the area with a native sagebrush steppe focused seed mix comprised of species present in the adjacent vegetative communities; seeding must occur within 1 year of cheatgrass treatment. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [7 points for 320 acres]

CI or CI/CP Information:

- Map suitable sagebrush steppe habitat areas
- Conduct baseline vegetation monitoring: height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Identify treatment areas noting treatment / reseed areas
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to prepare and reseed the area as identified and ensure success of reseeding

One time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[30]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[31] to verify treatment area trend

A16 Sagebrush Steppe Conservation Measure B: Treat stands of salt cedar and/or Russian olive within drainage areas, taking into consideration habitat needs of other species and addressing regrowth as necessary. Trees less than 1.75 miles from a sage-grouse lek will be removed and sprayed, others can be left in place. Report success-failure to the Association and repeat treatment as necessary [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS location of existing sage-grouse leks
- Identify individual trees or drainage areas that will be treated

[30] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[31] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

- Commit to treat identified areas

One-time Compliance Monitoring:

- Provide before and after digital photographs (panorama from center of sage-grouse lek) along with GPS coordinates of each photo point to the Association by January 31
- Report tree removal details (acres sprayed or number of individual trees sprayed or removed, amount and type of chemical, date of spray, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit the site at least once every 4 years to verify treatment performance

A16 Sagebrush Steppe Conservation Measure C: Remove pine or juniper (cedar) trees or non-sagebrush shrubs in areas where the ecological site suggests encroachment and that are within 1/4 mile of documented sagebrush steppe habitat; this may include physical or chemical removal methods [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map suitable sagebrush steppe habitat
- Identify individual trees or areas that will be treated
- Commit to remove trees in identified area

One-time Compliance Monitoring:

- Provide before and after digital photographs (1 set per removal site) along with GPS coordinates of each photo point to the Association by January 31
- Report tree removal details (acres sprayed or number of individual trees sprayed or removed, amount and type of chemical, date of spray, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit the site at least once every 4 years to verify treatment performance

A16 Sagebrush Steppe Conservation Measure D: Apply mechanical, chemical, or herbivore control methods for invasive plants other than cheatgrass over a managed area of at least 320 acres. Report success-failure to the Association and repeat treatment as necessary (if unsuccessful, review by the Association Board and Conservation Advisory Committee may be necessary) [3 points per 320 acres; maximum of 9 points]

CI or CI/CP Information:

- Identify invasive plant species and map proposed treatment areas
- Specify details of selected treatment methods (chemical concentration, additives, time of application, etc.); consult with Weed & Pest, UW Extension as necessary
- Commit to implement treatment methods
- Establish baseline photo points during growing season with GPS locations: 1 per project area, minimum of 1 per 160 acres

Performance Monitoring to Support Adaptive Management:

- Report treatment details (method used, acres treated, amount and type of chemical, date of treatment, etc.) to the Association by January 31 or as specified by the CI or CI/CP
- At each established photo point, photograph treatment areas annually within $\pm$ 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment status

A16 Sagebrush Steppe Conservation Measure E: Control invasive or noxious weeds across rural homesite acreages through chemical or herbivore treatments to protect forage, nest sites, and migration stop-over habitat [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify invasive or noxious plant species and map proposed treatment areas
- Specify details of selected treatment methods (chemical concentration, additives, time of application, etc.); consult with Weed & Pest, UW Extension as necessary
- Commit to implement selected treatment methods
- Establish baseline photo points during growing season with GPS locations: 1 per project area

One-time Compliance Monitoring:

- Report details of spraying (map of sprayed area, acres covered, spray equipment used, chemicals used, wind speed & direction, temperature, relative humidity, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph treatment areas annually within $\pm$ 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment status

A16 Sagebrush Steppe Benefits: Reducing or removing the loss of available sagebrush steppe habitat, including both forb and grass components, will maintain or improve the potential for nesting and brood-rearing success and/or capacity of winter habitat. Treatments that appropriately utilize herbicides (including rates and time of application) and/or herbivores will reduce the risk of extensive wildfires and help reduce the potential spread and habitat impacts of invasive plants which frequently colonize burned areas. These measures will also help to maintain or improve the potential for nesting and brood-rearing success and/or capacity of winter habitat.

Loss of Green Vegetation and Insects

A17 Sagebrush Steppe Threat: The availability and distribution of green vegetation and associated insects is extremely limited in northeast Wyoming due to the semi-arid climate and non-conducive soil types. Green area development and availability is generally dictated by the moisture content in the alluvium of streams and ephemeral draws. The lack of these areas is a potential limiting factor for sagebrush steppe populations in northeast Wyoming as areas of green vegetation provide increased insect availability, warm season foraging, and brood-rearing habitat. Lack of green areas also concentrates sage-grouse into fewer, smaller areas which increases the possibility of spreading West Nile virus and coccidiosis[32].

A17 Sagebrush Steppe Conservation Measure A: Develop additional, suitable, quality water sources (e.g., new wells, leaving on existing sources, modifying dams to increase green area, hauling water, etc.) to facilitate soil saturation while avoiding standing water issues in ephemeral draws located in documented brood-rearing habitat from May 15 to September 15 [2 points for each 100 feet or 1/10th of an acre of draw bottom green area developed]

CI or CI/CP Information:

- Map known sagebrush obligate brood rearing habitat

[32] Honess and Post (1968)

- Specify location and details of selected water development and Grazing Management Plan to avoid overutilization of developing green areas
- Commit to implement water development plan
- Establish baseline photo points during growing season with GPS locations: 1 per 100 feet or 1/10th of an acre

Performance Monitoring to Support Adaptive Management:

- Record green area width and length or provide NAIP or comparable aerial imagery (preferred) within ± 1 week of June 15, July 15, August 15, and September 15; report to the Association by January 31 of each year or as specified in the CI or CI/CP
- At each established photo point, photograph water development areas annually within ± 3 weeks of baseline photograph; provide digital photograph(s) or NAIP or comparable aerial imagery to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment area trend

A17 Sagebrush Steppe Conservation Measure B: Install and maintain effective snow fences (utilizing metal t-posts) to deposit snow in or adjacent to ephemeral draws to increase soil saturation within documented brood-rearing areas [1 point per 1,000 feet of snow fence]

CI or CI/CP Information:

- Specify location and details of snow fences and Grazing Management Plan to avoid overutilization of developing green areas
- Commit to install and maintain snow fences
- Establish baseline photo points during growing season with GPS locations: 1 per snow fence

One-time Compliance Monitoring:

- Report location and feet of snow fence installed to the Association by January 31

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph snow fence areas annually within ± 3 weeks of baseline photograph; provide digital photograph(s) or aerial imagery (NAIP or comparable) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment area trend

A17 Sagebrush Steppe Conservation Measure C: Install and maintain water detention (spreader) structures in ephemeral draws to increase soil saturation within documented brood-rearing areas with mosquito control and invasive species control commitments as necessary [2 points for 100 feet of spreader structure]

CI or CI/CP Information:

- Specify location and details of water detention structures and Grazing Management Plan to avoid overutilization of developing green areas
- Commit to install and maintain water detention structures
- Establish baseline photo points during growing season with GPS locations: 1 per spreader structure

One-time Compliance Monitoring:

- Report location and feet of spreader structures installed to the Association by January 31

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph water detention areas annually within ± 3 weeks of baseline photograph; provide digital photograph(s) or aerial imagery (NAIP or comparable) to the Association by January 31 of each year or as specified in the CI or CI/CP

- Association staff will visit the site at least once every 4 years to verify treatment area trend

A17 Sagebrush Steppe Conservation Measure D: For alluvial wells, commit to a reduction in historic water use rate in order to increase soil saturation [1 point for each 10 percent reduction, maximum 3 points]

CI or CI/CP Information:

- GPS locations of existing alluvial wells and water use rate during previous 5 years
- Specify Grazing Management Plan to avoid overutilization of developing green areas
- Commit to reduce historic water use rate and implement Grazing Management Plan
- Establish baseline photo points during growing season with GPS locations: 1 downstream from each alluvial well

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph developing green areas annually within $\pm$ 3 weeks of baseline photograph; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment area trend

A17 Sagebrush Steppe Conservation Measure E: In addition to developing green areas in ephemeral draws utilizing Conservation Measures A through D above, interseed native forbs or utilize forb seedlings in ephemeral draw bottoms or documented snow collection areas within brood-rearing habitat. Report success-failure to the Association and redo failed seeding until successful (if unsuccessful, review by the Association Board and Conservation Advisory Committee may be necessary) as compared to adjacent areas [2 points per 100 linear feet or $1/10^{th}$ of an acre in addition to green area development points, additional points available if utilizing forb seedlings]

CI or CI/CP Information:

- Identify and map sage-grouse brood-reading habitat
- Conduct baseline vegetation monitoring: forb absence or presence by species
- Report information along with GPS location of established vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Indicate proposed seeding parameters (pure live seed rate, seed mix composition, etc.)
- Specify Grazing Management Plan to avoid overutilization of developing green areas
- Commit to implement seeding and Grazing Management Plan

One-time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Monitor forb absence or presence by species annually between May 15 and July 1; report to the Association along with digital photograph by September 30 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[33] to verify treatment area trend

A17 Sagebrush Steppe Benefits: Increasing the soil moisture in ephemeral draws will increase the availability and distribution of green areas. The additional moisture will result in more extensive forb development and

[33] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

additional substrates which will produce more abundant insect populations. This will benefit brood-rearing success by providing additional habitat areas for insect and forb food sources to be developed, and will also benefit nest success by providing additional food source areas for foraging birds prior to hatch. Additional green areas will decrease sage-grouse density, decreasing the possibility of spreading West Nile virus and coccidiosis.

A18 Sagebrush Steppe Threat: Disturbance of riparian, wetland, and greenbelt areas can negatively impact water flow patterns and volumes, as well as negatively impact green area vegetation growing on these sites. This reduces the number and quality of existing green areas, negatively impacting the availability and quality of brood-rearing habitat. These reductions in key foraging areas would reduce brood-rearing and nesting success.

A18 Sagebrush Steppe Conservation Measure A: Protect green areas associated with springs, seeps, and sub-surface irrigation areas in suitable sagebrush steppe habitat by establishing appropriate herbivore barriers (fencing, etc. – all barriers must be adequately marked, not provide perch sites, and allow wildlife access) [3 points per spring or seep, maximum of 9 points]

CI or CI/CP Information:

- GPS locations of existing green areas within suitable sagebrush steppe habitat
- Specify details of herbivore barriers
- Commit to protect green areas through herbivore barriers
- Establish baseline photo points during growing season with GPS locations: 1 per green area

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph green areas annually within $\pm$ 3 weeks of baseline photograph; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment area trend

A18 Sagebrush Steppe Conservation Measure B: Place attractants (salt, mineral, supplements, fly rubs, etc.) at least 1/4 mile away from riparian habitats, springs, seeps, or green areas [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map riparian habitats, springs, seeps, or green areas
- GPS existing attractant locations
- Identify sites where attractants can be located
- Commit to place attractants in areas identified

Performance Monitoring to Support Adaptive Management:

- Report GPS locations of attractants to the Association by January 31 of each year or as specified in the CI or CI/CP.
- Association staff will visit the site at least once every 4 years to verify attractant location

A18 Sagebrush Steppe Benefits: Protecting water sources from disturbance will maintain and potentially increase the availability and quality of brood-rearing habitat. The protection and enhancement of these important foraging areas will maintain or increase nesting and brood-rearing success by providing additional habitat areas for forb food source development and will increase substrates for additional insect populations.

Power Lines

A19 Sagebrush Steppe Threat: Installation of power lines near suitable sagebrush steppe habitat can cause reduced use or abandonment. For example, habitat fragmentation by power lines can force birds away from prime nesting habitat into marginal habitat resulting in reduced nest success rates, thus reducing the overall population. Sagebrush obligates, particularly sage-grouse, can suffer injuries or mortalities from flying into power lines. Additionally, some of the lines and associated support structures can provide perches for raptors and support structures are height features that are avoided by sage-grouse as perceived raptor perches. These factors can lead to reduced use or abandonment of suitable sagebrush steppe habitat resulting in reduced nesting and brood rearing success and/or winter use capacity.

A19 Sagebrush Steppe Conservation Measure A - Operator: Site new distribution and transmission lines at least 6/10 mile away from sage-grouse leks and suitable sagebrush steppe habitat. Transmission lines and facilities are prohibited in sage-grouse core areas[34] [6 points for entire CI or CI/CP area; 6 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify suitable sagebrush steppe habitat and GPS sage-grouse lek site locations
- Document likelihood of new facilities and surface disturbance activities within 6/10 or 1 mile of Occupied Sage-grouse Leks and suitable sagebrush steppe habitat if not for the agreement to implement the Conservation Measure
- Commit to site new distribution and transmission lines in areas outside of suitable sagebrush steppe habitat

Performance Monitoring to Support Adaptive Management:

- Map and any changes in facilities or surface disturbance activities that occur within 6/10 or 1 mile of Occupied Sage-grouse Leks and suitable sagebrush steppe habitat; report changes or submit a "no new facilities or surface disturbance activities " statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify siting of facilities

A19 Sagebrush Steppe Conservation Measure B - Landowner: Establish surface use agreement with the Association requiring placement of distribution and transmission lines at least 6/10 mile away from sage-grouse leks and suitable sagebrush steppe habitat. Transmission lines and facilities are prohibited in sage-grouse core areas[35] [6 points for entire CI or CI/CP area; 6 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Document likelihood of new power line construction if not for the agreement to implement the Conservation Measure
- Specify surface use agreement details or reference signed agreement
- Commit to implement surface use agreement

One-time Compliance Monitoring:

- Sign surface use agreement with the Association

Performance Monitoring to Support Adaptive Management:

- Association staff will visit the site at least once every 4 years to verify siting of facilities

[34] Governor's Executive Order 2019-3

[35] Ibid.

A19 Sagebrush Steppe Conservation Measure C: Move or bury existing distribution and transmission lines which are within 6/10 mile of sage-grouse leks or suitable sagebrush steppe habitat [8 points for entire CI or CI/CP area; 8 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify suitable sagebrush steppe habitat and GPS sage-grouse lek locations
- Identify existing distribution or transmission lines to be removed or buried
- Commit to move or bury identified distribution or transmission lines which are within 6/10 mile of sage-grouse leks or suitable sagebrush steppe habitat.

One-time Compliance Monitoring:

- Report footage of distribution or transmission line removed to the Association by January 31
- For each contiguous segment of removed power line; provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit site to verify distribution and transmission line status

A19 Sagebrush Steppe Benefits: Keeping facilities at least 6/10 mile away from leks and suitable sagebrush steppe habitat will maintain or increase use of suitable sagebrush steppe habitats, reduce potential for sage-grouse lek abandonment or reduced use, reduce risk of sagebrush obligate loss from raptor predation, and reduce injuries and mortalities from direct collisions thus maintaining or increasing population levels.

Roads

A20 Sagebrush Steppe Threat: Roads, due to their long linear nature, are significant sources of habitat fragmentation and modification. Sagebrush obligates abandon use of highly fragmented habitat, reducing nest establishment and success, brood-rearing success, and/or winter use capacity. Traffic occurring close to Occupied Sage-grouse Leks can reduce the distance that calling males are heard thereby reducing attendance by females. This may ultimately cause sage-grouse leks to be abandoned. Traffic can also cause nesting birds in the near vicinity of the road to abandon nests. Unpaved roads can also modify surrounding habitat by serving as predator corridors.

A20 Sagebrush Steppe Conservation Measure A: Close, prepare seedbed, and reseed roads with a native seed mix within 3[36] miles of sage-grouse lek sites or 1-1/4 mile of suitable passerine habitat[37]. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [1 point per 1/4 mile including any necessary road relocation costs]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek site locations and suitable passerine habitat
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Map roads scheduled to be closed and existing easements
- Indicate planned location for any relocated roads
- Commit to close and reseed identified roads
- Establish 100’ (or comparable) reseeding transects and photo points and record GPS locations: 1 per treatment area

[36] Holloran and Anderson (2005) found a majority (64 percent) of nests within 3.1 miles of the lek
[37] Based on Bolger et al. (1997) distance from developed edge for sagebrush sparrows

One-time Compliance Monitoring:

- Association staff will visit site or use aerial imagery (NAIP or comparable) to verify road status

Performance Monitoring to Support Adaptive Management[38]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site or use aerial imagery (NAIP or comparable) at least once every 4 years[39] to verify treatment area trend

A20 Sagebrush Steppe Conservation Measure B: Document existing improved and two-track roads and commit to no new roads to be developed within 6/10 mile of suitable sagebrush steppe habitat [up to 5 points for entire CI or CI/CP area depending on existing roads]

CI or CI/CP Information

- Identify and map suitable sagebrush steppe habitat
- Map existing roads and existing easements
- Document likelihood that new roads will be built if not for the agreement to implement the Conservation Measure
- Commit to not develop any new roads within 6/10 mile of suitable sagebrush steppe habitat

Performance Monitoring to Support Adaptive Management:

- GPS and report placement of any new roads to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report road access management actions to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[40] to verify road status

A20 Sagebrush Steppe Benefits: Reducing habitat modification and fragmentation from roads can maintain and potentially increase sagebrush obligate use capacity by favorably affecting nest establishment and success, brood rearing success, and/or winter use capacity. Other benefits include reduction of noise and human disturbance along the road within a critical distance of nesting and brood rearing habitat and the sage-grouse lek.

[38] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[39] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

[40] This frequency is based on the current update cycle of National Agriculture Imagery Program data

Subdividing Native Habitats

A21 Sagebrush Steppe Threat: Subdividing native sagebrush habitats for development of ranchettes, housing units, or other urban uses is a significant source of fragmentation and permanent habitat conversion. Nest establishment and success, brood-rearing success, and/or winter use capacity of habitat are reduced with fragmentation and sagebrush obligates can abandon use of highly fragmented habitat. Subdivisions also create a zone of negative influence as they attract foraging predators that have an ecological association with humans. These predators include coyotes, red foxes, raccoons, ravens, and domestic pets, among others.

A21 Sagebrush Steppe Conservation Measure A: Commit to maintaining the land configuration to benefit sagebrush obligates (no additional fragmentation or alteration of land use, e.g., subdivisions, etc.) [6 points for a minimum of 320 contiguous acres of important habitat areas; maximum of 10 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify and map suitable sagebrush habitat and/or entire ranch
- Map existing land configuration specifying existing land use
- Document likelihood of changes in land configuration or use if not for the agreement to implement the Conservation Measure
- Commit to maintain the land to benefit sagebrush obligates

One-time Compliance Monitoring:

- Sign agreement with the Association committing to maintain current land configuration

Performance Monitoring to Support Adaptive Management:

- Map and report any changes in land configuration or use to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[41] to verify land use

A21 Sagebrush Steppe Conservation Measure B: Allow native grasses, forbs, and shrubs to remain on at least 60 percent of rural homesite acreage to provide connectivity and forage. Acreage must be contiguous [1 point per 10 acres]

CI or CI/CP Information:

- Identify and map native vegetation areas and disturbed areas
- Conduct baseline vegetation monitoring: height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Commit to allow contiguous acreage of native grasses, forbs, and shrubs to remain on at least 60 percent of rural homesite acreage.

Performance Monitoring to Support Adaptive Management:

- Trend Verification: At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[42] to verify protection area trend

[41] This frequency is based on the current update cycle of National Agriculture Imagery Program data

[42] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

A21 Sagebrush Steppe Benefits: Maintaining intact habitat blocks will reduce fragmentation and retain or potentially increase sagebrush habitat connectivity and forage. This will favorably impact nest establishment and success, brood-rearing success and/or winter use capacity.

Wildfires

A22 Sagebrush Steppe Threat: Wyoming big sagebrush is easily destroyed by wildfires with recovery requiring time frames in excess of 100 years.[43] Burns in northeast Wyoming are particularly vulnerable to colonization by cheatgrass which can change the vegetation composition and restrict or prevent sagebrush obligates from utilizing even lightly burned habitat. The change in vegetation composition will likely cause sagebrush obligates to abandon the burned habitat (particularly those less than 50 years post-fire) and move into more marginal habitats resulting in reduced nesting and brood-rearing success and/or capacity of winter habitat. Even native species that regenerate on burned areas but have low value as sagebrush steppe habitat can reduce or eliminate sagebrush obligate use.

A22 Sagebrush Steppe Conservation Measure A: Commit to suppressing all wildfires in suitable sagebrush steppe habitat areas occurring within the area covered by the CI or CI/CP [1 point for a minimum of 40 acres suitable sagebrush steppe habitat]

CI or CI/CP Information:

- Identify and map suitable sagebrush steppe habitat
- Map fire suppression areas
- Commit to suppressing all wildfires in suitable sagebrush steppe habitat areas

Immediate Actions:

- Notify the Association within 5 days of any applicable wildfire suppression efforts
- GPS wildfire boundary within 45 days

Performance Monitoring to Support Adaptive Management:

- Report GPS wildfire boundary and suppression efforts to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify wildfire impacts and recovery status

A22 Sagebrush Steppe Conservation Measure B: Spray suitable occupied sagebrush steppe habitat burned by wildfires with imazapic[44] or other herbicide / method approved by the Association within 1 year of fire and, if necessary, reseed with a native grass and sagebrush mix after fires that occur on the area covered by the Agreement. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [3 points per 80 collective acres, additional points available if more intensive monitoring is done]

CI or CI/CP Information:

- Identify and map suitable sagebrush steppe habitat

[43] In a southeast Montana study, Cooper et al (2007) found that post-fire recovery rates for Wyoming big sagebrush were less than 1 percent per year and that cheatgrass increased after burning. The highest recovery rate recorded in the study was 27 percent recovery after 37 years.

[44] Shinn and Thill (2002) have indicated that proposed techniques to reduce cheatgrass densities include treatments with herbicides such as imazapic

- Indicate cheatgrass treatment method and proposed seeding parameters - herbicide name, pure live seed rate, seed mix composition, etc.
- Commit to spray areas burned and reseed with native grass and sagebrush mix after fires.

Immediate Actions:

- GPS wildfire boundary within 45 days
- Establish baseline photo points with GPS locations within 45 days of wildfire: 1 per project area, minimum of 1 per 160 acres
- Determine treatment (herbicide or other method) in conjunction with the Association

Performance Monitoring to Support Adaptive Management:

- Report treatment details (acres covered, chemicals used, wind speed & direction, seeding rate, invoices, seed mix tag, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- At each established photo point, photograph burn area annually within $\pm$ 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify spray / re-seeding efforts

A22 Sagebrush Steppe Benefits: Protecting Wyoming big sagebrush and reducing the risk of colonization of burned areas by invasive species, especially cheatgrass, will reduce the loss of available sagebrush steppe habitat. Treatments with imazapic in the planning area have demonstrated the effectiveness of this Conservation Measure[45], especially for burns that have principally affected the understory. In this regard, the treatments will be particularly beneficial for nesting and brood-rearing habitat. The provision to reseed burned areas as necessary will provide competition by desirable and utilitarian native species against undesirable invasive species.

Windmills

A23 Sage-grouse Threat: Windmill towers are potential raptor perch sites which can cause sage-grouse to avoid habitats near windmills. This may cause grouse to abandon associated prime habitats and move into more marginal habitats resulting in reduced nesting and brood-rearing success and/or capacity of winter habitat.

A23 Sage-grouse Conservation Measure: Retrofit existing windmill pump system and remove windmill towers within 1 mile of known sage-grouse lek sites and Occupied Sage-grouse Habitat [1 point per retrofit, maximum of 4 points]

CI or CI/CP Information:

- GPS sage-grouse lek locations and existing windmills; map occupied sage-grouse areas
- Identify windmill tower(s) to be removed
- Commit to retrofitting windmill pump systems and removing identified windmill towers within 1 mile of known sage-grouse lek sites and Occupied Sage-grouse Habitat

One-time Compliance Monitoring:

- Report number of windmills removed to the Association by January 31

[45] 2008 Thunder Basin Grasslands Prairie Ecosystem Association Annual Report

- For each removed windmill, provide before and after digital photograph(s) from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit site or use aerial imagery (NAIP or comparable) to verify water facility status

Performance Monitoring to Support Adaptive Management:

- Association staff will use aerial imagery (NAIP or comparable) at least once every 6 years to verify water facility status

A8 Sage-grouse Benefits: These measures will reduce risk of sage-grouse loss from raptor predation and maintain or increase use of Suitable Sage-grouse Habitats near water facilities.

Habitat Curtailment

Crop Lands

A24 Sagebrush Steppe Threat: Activities on areas currently used for hay production in close proximity to sagebrush stands are potential threats to nesting sage-grouse hens and broods when cutting and baling activities occur before late July[46]. Haying during the nesting and brood rearing season can cause disturbance and direct mortality leading to a decrease in nest establishment/success and/or brood rearing success.

A24 Sagebrush Steppe Conservation Measure A: Minimize impact for those areas where haying is still occurring by delaying the initiation of cutting and baling activities until July 31 [1 point for a collective 20 acres; maximum of 5 points]

CI or CI/CP Information:

- Map current haying areas
- Document haying use during previous 5 years
- Commit to delay the initiation of cutting and bailing activities until July 31

Performance Monitoring to Support Adaptive Management:

- Report dates of cutting and baling activities to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years between June 15 and August 1 to verify status of haying activities

A24 Sagebrush Steppe Conservation Measure B: Minimize impact for those areas where haying use is still occurring by utilizing harvest techniques designed to reduce mortality (e.g., starting from the middle and moving out, starting at one edge and moving across, using flushing bars or other equipment modifications, etc.) [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Map current haying use areas
- Document haying use during previous 5 years
- Specify details of selected harvest techniques
- Commit to using selected harvest techniques to minimize impacts

[46] Paige and Ritter (1999)

Performance Monitoring to Support Adaptive Management:

- Report success / failure of selected harvest techniques to reduce mortality to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years between June 15 and August 1 to verify status of haying activities

A24 Sagebrush Steppe Benefits: Delaying agricultural activities until July 31 and utilizing appropriate harvest techniques will reduce disturbance and direct mortality thus increasing nesting and brood-rearing success.

Energy Development: Mining

A25 Sagebrush Steppe Threat: Coal mine facility establishment in the pit advance area can contribute to habitat fragmentation, particularly in cases where facilities are in high densities. Similarly, exploration activities during the nesting season in areas in advance of the pit disturbance can result in nest abandonment or reduced nest success. Sagebrush obligates abandon use of highly fragmented habitat; nest establishment/success, brood-rearing success, and/or winter use capacity of habitat is reduced with fragmentation.

A25 Sagebrush Steppe Conservation Measure A: Commit to evaluating and addressing the needs of sagebrush obligates when siting mining-related infrastructure with significant ground disturbance in areas ahead of where the mining process has been initiated (i.e., topsoil removal.) Avoid new surface occupancy or new surface disturbance activities within 6/10 mile of Occupied Sage-grouse Leks from March 1 to May 15 from 6 pm to 8 am [5 points for entire CI or CI/CP area; 5 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify suitable sage-grouse brush steppe habitat and GPS sage-grouse lek site locations
- Map existing facilities within 6/10 or 1 mile of Occupied Sage-grouse Leks
- Commit to evaluate and address the needs of sagebrush obligates when siting mining-related infrastructure
- Document future pit advance and other surface disturbance activities

Performance Monitoring to Support Adaptive Management:

- Map any pit advance or surface disturbance activities within 6/10 or 1 mile of Occupied Sage-grouse Leks; report changes or submit a "no pit advance or new surface disturbance activities " statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify siting of facilities

A25 Sagebrush Steppe Conservation Measure B: Commit to evaluating and addressing the needs of sagebrush obligates when siting mining-related infrastructure with significant ground disturbance in areas ahead of where the mining process has been initiated (i.e., topsoil removal.) Check on nesting activity in areas planned for exploration or for activities which require significant surface disturbance within the 3-mile buffer (non-core areas) around sage-grouse leks and avoid surface disturbance within 6/10 mile of located nests between March 1 and May 15 from 6 pm to 8 am. Operations that have applicable sage-grouse collaring and tracking studies may rely on this information to evaluate the impact of and potentially justify clearance for disturbance within the 3-mile buffer. Following initiation of approved disturbance activities (i.e., topsoil removal), this action will be replaced by a comparable Conservation Measure [5 points for entire CI or CI/CP area; 5 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify suitable sagebrush steppe habitat and GPS sage-grouse lek site locations
- Provide GPS locations of known sage-grouse nesting sites
- Map existing facilities within 3 miles of Occupied Sage-grouse Leks or suitable sagebrush obligation habitat
- Document future pit advance and other surface disturbance activities
- Commit to evaluate and address the needs of sagebrush obligates when siting mining-related infrastructure
- If timing of disturbance is known, identify replacement Conservation Measure(s)

Performance Monitoring to Support Adaptive Management:

- Map any pit advance or surface disturbance activities within 3 miles of Occupied Sage-grouse Leks or suitable sagebrush obligation habitat; report changes or submit a "no pit advance or new surface disturbance activities " statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[47] to verify siting of facilities

A25 Sagebrush Steppe Benefits: These actions, which are above and beyond regulatory requirements, will identify suitable sagebrush steppe habitat and reduce impacts from facility disturbance, resulting in the reduction of habitat fragmentation factors. This will maintain the size of intact habitat blocks, maintaining and potentially increasing sagebrush obligate use capacity, favorably affecting nest establishment and success, brood rearing success, and/or winter use capacity. Similarly, proactive assessment of nesting activity within areas planned for exploration or surface disturbance during the nesting season and avoidance of disturbance of active nests, will increase sagebrush obligate nesting success.

A26 Sagebrush Steppe Threat: Herbivore foraging on seedling sagebrush plants on coal mine reclamation can significantly stunt the shrubs and/or reduce the shrub density, extending the time required for that reclamation to provide sagebrush of sufficient height and density for sagebrush obligates. Poor quality shrub reclamation is habitat lost to sagebrush obligates during the reestablishment period.

A26 Sagebrush Steppe Conservation Measure: Protect re-established early seral sagebrush habitat from overuse by wildlife for the term of the CI or CI/CP [1 point for every collective 40 acres protected from big game; 2 points for every collective 40 acres protected from big game and rabbits]

CI or CI/CP Information:

- Map early seral sagebrush habitat to be protected
- Specify selected protection methods
- Commit to implementing protection methods
- Establish baseline photo points with GPS locations: 1 per project area, minimum of 1 per 160 acres

Performance Monitoring to Support Adaptive Management:

- Map and report protection methods employed to the Association by January 31 of each year or as specified in the CI or CI/CP
- Provide excerpt of DEQ report detailing protected sagebrush habitat parameters

[47] This frequency is based on the current update cycle of National Agriculture Imagery Program data

- At each established photo point, photograph protected habitat annually within ± 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify habitat protection practices

A26 Sagebrush Steppe Benefits: Reducing herbivore impacts on seedling sagebrush increases the quality of the reclamation for sagebrush obligates and decreases the time that the disturbed habitat is unavailable for sagebrush obligate use. This increases the likelihood of reclamation use by sagebrush obligates for nesting, brood-rearing, and/or winter use.

Excessive Sagebrush Canopy

A27 Sage-grouse Threat: Sagebrush canopy cover can become dense enough[48] that desirable forbs and perennial grasses in the understory are diminished or eliminated. In other sagebrush stands, desirable forbs and cool-season bunchgrasses in the understory are diminished or have been eliminated due to past disturbances. This can cause sage-grouse to move into more marginal habitats resulting in reduced nesting and brood-rearing success.

A27 Sage-grouse Conservation Measure A: For brood-rearing areas, utilize chemical treatments[49] or focused winter feeding sites[50] and subsequent browsing with sheep to open the canopy in a collective 40 acres of dense (greater than 35 percent[51] sagebrush canopy cover with adequate understory) sagebrush stands in Suitable Sage-grouse Habitat areas. Site selection should consider season of use by sage-grouse, existing understory, sagebrush density, and other landscape factors, including use by other wildlife. Under certain conditions, cattle or goats may accomplish the same effect [1 point for a collective 40 acres]

CI or CI/CP Information:

- Identify and map Suitable Sage-grouse Habitat and focused winter feeding sites
- Conduct baseline vegetation monitoring: height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Commit to use chemical treatments or focused winter feeding sites

Performance Monitoring to Support Adaptive Management[52]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data to the Association by January 31 of each year or as specified in the CI or CI/CP

[48] Cagney et al. (2009) indicates that nesting hens tend to select an average 23 percent live sagebrush canopy cover, early brood-rearing cover has more open patches with the range of 10-15 percent live sagebrush canopy cover. Connelly et al. (2000) in Table 3 indicate the following characteristics of sagebrush rangeland needed for productive sage grouse habitat: Breeding (15-25 percent), Brood-rearing (10-15 percent) and Winter (10-30 percent).

[49] Autenrieth (1981) noted that chemical treatments to reduce sagebrush canopy may enhance brood-rearing habitats when applied in early spring to increase the coverage of herbaceous plant foods.

[50] Sedgewick (2004) outlines that browsing animals may be used as biocontrol for reducing the densities of sagebrush and potentially increasing the herbaceous component.

[51] Connelly et al. (2000) recommend that mechanical or chemical treatments should be used in areas with greater than 35 percent total shrub cover to improve late brood-rearing habitat.

[52] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report treatment details (livestock numbers, in/out dates, supplemental forage amount and days fed at each site, anticipated plan modifications, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[53] to verify treatment area trend

A27 Sage-grouse Conservation Measure B: Seed desirable native forb and cool-season grass species in a collective 80 acres of sagebrush stands in Suitable Sage-grouse Habitat areas using hoof action or other methods to incorporate seeds. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [3 points for a collective 80 acres]

CI or CI/CP Information:

- Identify and map Suitable Sage-grouse Habitat and selected seeding sites
- Conduct baseline vegetation monitoring: height and cover by species
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to implement seeding

One-time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[54]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[55] to verify treatment area trend

A27 Sage-grouse Benefits: Restoring the sagebrush / understory balance can improve sage-grouse habitat. This can improve nesting and brood-rearing success, and/or winter use capacity.

[53] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.
[54] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C
[55] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

Human Disturbance

A28 Sage-grouse Threat: Human activities and noise in close proximity to Occupied Sage-grouse Leks during the sage-grouse breeding season can reduce the distance that calling males can be heard thereby reducing lek attendance by females, can cause nesting hens in the near vicinity of the lek and facilities to abandon nests, and can cause the leks to become inactive over time. This potentially reduces the productive capacity of the affected sage-grouse population.

A28 Sage-grouse Conservation Measure A: Evaluate and address the needs of sage-grouse when siting facilities. Establish a 6/10 mile no surface occupancy zone around known Occupied Sage-grouse Lek sites. In addition, avoid human surface disturbance activities within 6/10 mile of known occupied lek sites from March 1 to May 15 from 6 pm to 8 am [2 points for entire CI or CI/CP area; 2 additional points for expanding avoidance radius to 1 mile]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek site locations
- Map existing facilities within 6/10 or 1 mile of Occupied Sage-grouse Leks
- Commit to evaluate and address the needs of sage-grouse when siting facilities, including avoiding disturbance within 6/10 mile of known occupied lek sites from specified dates
- Document likelihood of new facilities and surface disturbance activities within 6/10 or 1 mile of known occupied leks if not for the agreement to implement the Conservation Measure

Performance Monitoring to Support Adaptive Management:

- Map any changes in facilities or surface disturbance activities within 6/10 or 1 mile of Occupied Sage-grouse Leks; report any changes or submit a "no changes to facilities or surface disturbance activities" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years between March 1 and May 15 to verify siting of facilities and surface disturbance activities

A28 Sage-grouse Conservation Measure B: Establish site-specific plans (e.g., grazing /calving pastures, mine-related activities, oil & gas activity, etc.) for restricting surface disturbance activities from March 1 to June 15 within a 3[56] mile nesting area around Occupied Sage-grouse Leks [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek site locations
- Map existing facilities within 3 miles of Occupied Sage-grouse Leks
- Commit to establish and implement site-specific plans for restricting surface disturbance activities from March 1 to June 15 within specified distance
- Document likelihood of new facilities and surface disturbance activities within 3 miles of Occupied Sage-grouse Leks

Performance Monitoring to Support Adaptive Management:

- Map any changes in facilities or surface disturbance activities that occur within 3 miles of Occupied Sage-grouse Leks; report any changes or submit a "no changes to facilities or surface disturbance activities" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years between March 1 and June 15 to verify surface disturbance activities

[56] Holloran and Anderson (2005) found a majority (64 percent) of nests within 3.1 miles of the lek

A28 Sage-grouse Conservation Measure C: Limit noise levels to less than 10 dBA[57] above ambient (or current research) measured with a handheld device at the perimeter of Occupied Sage-grouse Leks from March 1 to May 15 from 6 pm to 8 am [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify and GPS Occupied Sage-grouse Lek site locations
- Record 3 typical noise level samples with a hand-held device between March 1 and May 15 from 6 pm to 8 am at the sage-grouse lek perimeter
- Commit to limit noise levels
- Document existing facilities and likelihood of new facilities

Performance Monitoring to Support Adaptive Management:

- Map any changes in facilities that occur within 6/10 mile of Occupied Sage-grouse Leks; report any changes or submit a "no changes to facilities" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report results of 3 typical noise level samples at sage-grouse lek perimeter to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years between March 1 and May 15 to verify surface disturbance activities

A28 Sage-grouse Benefits: Removing or reducing human disturbance and noise near the sage-grouse lek during the breeding season will potentially increase the productive capacity of the lek, reduce nest abandonment risks in the nearby vicinity, and increase the overall productive capacity of the sage-grouse population affected.

Inappropriate / Poor Quality Reclamation

A29 Sagebrush Steppe Threat: Since sagebrush obligates utilize native vegetation communities, seeding with non-native plant species can produce poor quality reclamation results, especially if highly aggressive non-native plant species are used. Highly aggressive non-native species can establish habitat that is unusable by sagebrush obligates and can prevent natural reestablishment of sagebrush steppe habitat available for nesting, brood-rearing, and/or winter use.

A29 Sagebrush Steppe Conservation Measure A: Seed disturbed (e.g., burns, Go-back Lands, watering, salt, bedgrounds, erosional features, relocated roads, etc.) and reclaimed areas with native seed mix comprised of species present in the adjacent vegetative communities; seeding must occur within 1 year of site reclamation. Report success-failure to the Association and redo failed seeding until successful as compared to adjacent areas [2 points per 40 acres, higher points if sagebrush is included in the mix; maximum of 8 points]

CI or CI/CP Information:

- Identify and GPS disturbed and reclaimed areas
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Conduct baseline vegetation monitoring: height and cover by species
- Commit to seed disturbed and reclaimed areas with native seed mix
- Report information along with GPS location of established 100' (or comparable) vegetation transects and photo points: 1 per project area, minimum of 1 per 160 acres

[57] Patricelli et al. (2010)

One-time Compliance Monitoring:

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[58]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data and seeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years[59] to verify treatment area trend

A29 Sagebrush Steppe Conservation Measure B: Develop and field test seed mixes comprised of native species suited to specific ecosites that provide competition against invasive species [5 points per unique test, maximum 10 points]

CI or CI/CP Information:

- Identify specific parameters of seed mixes - suitable for particular soil types, forb or shrub component, etc.
- Identify timeline for completion of seed mix and field tests
- Commit to develop and field test seed mixes and share test results
- Establish baseline photo points of seed test areas during growing season with GPS locations: 1 per seed test area

Reporting Requirements:

- Provide details of each field test initiated during the year (location, acres covered, seedbed preparation methods used, seed mix used, seeding equipment used, dates of seeding, invoices, seed mix tag, etc.) to the Association by January 31
- At each established photo point, photograph seeded area annually within $\pm$ 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Provide the Association with final seed mix parameters and complete results of field tests by January 31 or as specified in the CI or CI/CP

A29 Sagebrush Steppe Conservation Measure C: Develop or fund a custom grown native or cultivar sagebrush and forb seed or seedling program where 50 percent of the annual production would be available to the participating member(s) and 50 percent would be available to the Association. This measure can also apply to a seed storage program. The Association's share could be retained or sold by the custom grower if no Association projects were planned for the current year [8 points]

[58] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

[59] This frequency is adapted from WDEQ-LQD Guideline 14 which specifies that at least two interim vegetation monitoring events occur within a 10-year period following the initial sampling to evaluate reclamation success trends.

CI or CI/CP Information:

- Identify specific seeds/seedlings to be grown
- Identify timeline for seed/seedling production
- Commit to implement seed/seedling production

One-time Compliance Monitoring:

- Submit signed agreement with custom grower to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements:

- Provide details of seed/seedling production during the year to the Association by January 31
- Association staff will visit custom grow site at least once every 4 years to verify seed/seedling production status

A29 Sagebrush Steppe Benefits: Increasing the area of native plant communities will increase potential sagebrush steppe habitat. Development and field testing of seed mixes appropriate to the area and development of secure sagebrush and forb seed sources will increase our ability to restore and enhance sagebrush steppe habitat. The establishment of appropriate food sources, nesting conditions, brood-rearing, and/or wintering habitat in reclaimed areas will reduce the potential for establishment of a reclamation vegetation community that is not usable by sagebrush obligates and will ultimately increase the total sagebrush steppe habitat available.

A30 Sagebrush Steppe Threat: Poor quality seedbed conditions or materials (e.g., lack of topsoil, use of highly contaminated topsoil, use of non-native plant species for reclamation seeding, significantly delayed reclamation, etc.) can produce poor quality reclamation of disturbances and substantially increase the time before sagebrush steppe habitat is reestablished on the disturbed site. Poor quality reclamation is habitat lost to sagebrush obligates for that reestablishment period and reduces the available habitat for nesting, brood-rearing, and/or winter use.

A30 Sagebrush Steppe Conservation Measure A - Operator: Commit to separating topsoil from other soil materials when constructing pipelines or well pad locations, replacing, seeding with appropriate native seed mix as soon as practical after construction ends, reporting success-failure to the Association, and redoing failed seeding until successful as compared to adjacent areas [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document likelihood of new construction activities if not for the agreement to implement the Conservation Measure
- Specify details of topsoil separation measures
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to implement proposed seeding parameters
- Establish 100' (or comparable) vegetation transects and photo points with GPS locations: 1 per project area, minimum of 1 per 160 acres

One-time Compliance Monitoring:

- For each topsoil separation activity, provide 1 digital photograph to the Association by January 31 of each year or as specified in the CI or CI/CP

- Report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management[60]:

- Establishing Trend (first 5 years): At each transect, monitor vegetation species height & cover by species and take 1 digital photograph along transect annually between June 15 and August 15; report monitoring data and reseeding success / failure as compared to adjacent areas to the Association by January 31 of each year or as specified in the CI or CI/CP
- Trend Verification (following years): At each transect, take 1 digital photograph annually between June 15 and August 15. Monitor vegetation species height and cover by species every 5th year between June 15 and August 15. Provide data to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit site at least once every 4 years to verify topsoil handling methods and seeding results

A30 Sagebrush Steppe Conservation Measure B - Landowner: Commit to negotiating surface damage agreements that require operators to separate topsoil from other soil materials when constructing pipelines or well pad locations, replacing the topsoil, and seeding with a native seed mix as soon as possible after construction ends [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document likelihood of new construction activities if not for the agreement to implement the Conservation Measure
- Specify details of topsoil separation measures
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to negotiate surface damage agreements with specific topsoil and seeding measures

One-time Compliance Monitoring:

- Obtain surface damage agreement within 5 years of CI or CI/CP signing
- Submit a signed copy of the agreement to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit site at least once every 4 years to verify topsoil handling methods and seeding results

A30 Sagebrush Steppe Benefits: High quality seedbed material and planting of native species will increase the quality of the reclamation for sagebrush obligates and decrease the time that the disturbed habitat is unavailable for sagebrush obligate use. This will increase sagebrush obligate use for nesting, brood-rearing, and/or winter use.

A31 Sagebrush Steppe Threat: Oil and gas facility designs which do not provide erosion protection and/or controls can cause erosion at facility sites, thus increasing the total area of disturbance. If left unchecked, erosion can create siltation streams that fragment additional native areas. These represent greater habitat loss or fragmentation for sagebrush obligates, potentially reducing breeding, brood-rearing, and/or winter use.

[60] Trend procedures are adapted from State of Wyoming Executive Order 2019-3, Appendix C

A31 Sagebrush Steppe Conservation Measure: Commit to appropriate wind and water erosion control of sites, locations, roads, and pipelines [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Specify details of wind and water erosion control methods
- Commit to implement appropriate wind and water erosion controls
- Establish baseline photo points with GPS locations: 1 per control location

Performance Monitoring to Support Adaptive Management:

- Report details of erosion control activities (location, acres covered, methods used, monitoring schedule, effectiveness, information on any controls that included reseeding, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- At each established photo point, photograph erosion control areas annually within ± 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify erosion control activities

A31 Sagebrush Steppe Benefits: Reducing the total disturbance areas of well pads and other oil and gas facilities will reduce habitat fragmentation potential, and increase the likelihood of adjacent habitat use by sagebrush obligates for nesting, brood-rearing, and/or winter use.

A32 Sagebrush Steppe Threat: Since sagebrush obligates utilize native vegetation communities, weed infestation of native or reclaimed areas removes or reduces those areas as potential habitat for sagebrush obligates. Similarly, use of non-native plant species for reclamation of oil and gas disturbances can produce poor quality reclamation results, especially if highly aggressive non-native plant species are used. Highly aggressive non-native species can establish habitat that is unusable by sagebrush obligates and can prevent natural reestablishment of sagebrush steppe habitat available for nesting, brood-rearing, and/or winter use.

A32 Sagebrush Steppe Conservation Measure - Landowner: Commit to negotiating surface damage agreements that require oil and gas operators to conduct invasive weed control, reclaim disturbance with native seed mix, commit to redo failed seeding until successful as compared to adjacent areas, and report success-failure to the Association [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document likelihood of new oil & gas activities if not for the agreement to implement the Conservation Measure
- Indicate proposed seeding parameters - pure live seed rate, seed mix composition, etc.
- Commit to negotiate surface damage agreements that include the proposed seeding parameter

One-time Compliance Monitoring:

- Obtain surface damage agreement within 5 years of CI or CI/CP signing
- Submit a signed copy of the surface damage agreement to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will visit the site at least once every 4 years to verify invasive weed control and reclamation activities

A32 Sagebrush Steppe Benefits: Controlling invasive weeds and increasing the area of native plant communities will increase potential sagebrush steppe habitat. Reducing reclamation vegetation communities that are not usable by sagebrush obligates, and establishing appropriate food sources and habitat conditions on the reclaimed area will favorably affect nest establishment and success, brood rearing success, and/or winter use capacity.

Prescribed Fires

A33 Sagebrush Steppe Threat: Wyoming big sagebrush is easily destroyed by fire with reestablishment requiring time frames in excess of 100 years.[61] Depending on the extent and intensity of the fire, significant areas of habitat can be fragmented or rendered unsuitable either through direct habitat destruction or secondary invasion by undesirable vegetative species. This can cause sagebrush obligates to move into more marginal habitats resulting in reduced nesting and brood-rearing success and/or capacity of winter habitat.

A33 Sagebrush Steppe Conservation Measure A: Commit to not conducting any prescribed fires within 6 miles of Occupied Sage-grouse Leks and within 1 1/4 miles of known sagebrush steppe habitat[62] [3 points, 6 points if within areas identified as receiving less than 12 inches in annual precipitation]

CI or CI/CP Information:

- GPS locations of Occupied Sage-grouse Leks and map of known sagebrush steppe habitat
- Document number and size of prescribed fires during previous 5 years
- Commit to not use prescribed fire in or near sage-grouse leks as described

Performance Monitoring to Support Adaptive Management:

- Submit a "no prescribed fires" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Notify Association of any fires occurring within 6 miles of Occupied Sage-grouse Leks or within 1-1/4 miles of known sagebrush steppe habitat
- Association staff will use aerial imagery (NAIP or comparable) at least once every 3 years[63] to verify absence of prescribed fire or as needed to map fire boundaries

A33 Sagebrush Steppe Conservation Measure B: Use site-specific designs approved by the Association for prescribed burns. This measure applies only to areas outside of core, within 6 miles from Occupied Sage-grouse Leks or other areas documented as being used by sagebrush obligates, where sagebrush canopy cover is above 15 percent, and receiving more than 12 inches in average annual precipitation. Consideration must be given to other control measures such as tebuthiuron applications or focused grazing. Prescribed fire will only be used to reduce encroachment of non-sagebrush shrubs, reduce the potential for catastrophic fire and rejuvenate the sagebrush understory. Burns will be planned to occur from August 1 to March 1 depending on sagebrush obligates' use of habitat, extent of invasive species cover, and burn objective. Burns will consist of small mosaic patterns with target patch size of 50 acres or less and maximum width of 200 feet. If necessary, prescribed burn areas will be sprayed with imazapic or other herbicide approved by the Association and/or reseeded with a native grass/forb seed mix. A maximum of 32 acres of sagebrush will be disturbed per section. Report success-

[61] In a southeast Montana study, Cooper et al (2007) found that post-fire recovery rates for Wyoming big sagebrush were less than 1 percent per year and that cheatgrass increased after burning. The highest recovery rate recorded in the study was 27 percent recovery after 37 years.

[62] Based on Bolger et al. (1997) distance from developed edge for sagebrush sparrows

[63] This frequency is based on the current update cycle of National Agriculture Imagery Program data

failure to the Association and redo failed seeding until successful as compared to adjacent areas [up to 8 points for a maximum of 640 acres disturbed]

CI or CI/CP Information:

- GPS locations of sage-grouse leks and map of suitable sagebrush steppe habitat
- Indicate herbicide application and proposed seeding parameters - herbicide name, pure live seed rate, seed mix composition, etc.
- Map location of prescribed fire
- Identify site-specific design including fire control measures
- Commit to implement site-specific designs for any necessary prescribed burns
- Establish baseline photo points with GPS locations: 1 per project area, minimum of 1 per 160 acres

Immediate Actions:

- Notify the Association at least 5 days before the prescribed fire so Association staff can be on site
- At each established photo point, photograph area within 5 days of prescribed fire
- GPS prescribed fire boundary within 45 days of burn

One-time Compliance Monitoring:

- Report details of prescribed fire (acres burned, wind direction and speed, air temperature, photographs, GPS of boundary, etc.) to the Association by January 31 or as specified in the CI or CI/CP
- If necessary, report details of spraying (map of sprayed area, acres covered, spray equipment used, chemicals used, wind speed & direction, temperature, relative humidity, etc.) to the Association by January 31 or as specified in the CI or CI/CP
- If necessary, report details of seeding (map of seeded area, acres covered, seedbed preparation methods used, seeding equipment used, dates of seeding, seed invoices, seed mix tag, etc.) to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph prescribed fire annually within $\pm$ 3 weeks of baseline photograph anniversary date; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment response

A33 Sagebrush Steppe Benefits: Eliminating habitat impacts from prescribed burns that were planned to improve livestock grazing conditions will reduce loss of available sagebrush steppe habitat, including both canopy and understory components. Allowing planned, approved prescribed burns in higher precipitation areas will help reduce encroachment of non-sagebrush shrubs, reduce potential of catastrophic fire, and rejuvenate the sagebrush understory. Both will maintain or improve the potential for nesting and brood-rearing success by protecting or rejuvenating sagebrush stands.

Roads

A34 Sagebrush Steppe Threat: Roads, due to their long linear nature, are significant sources of habitat fragmentation and modification. Sagebrush obligates abandon use of highly fragmented habitat, reducing nest establishment and success, brood-rearing success, and/or winter use capacity. Traffic occurring close to Occupied Sage-grouse Leks can reduce the distance that calling males are heard thereby reducing attendance by females. This may ultimately cause sage-grouse leks to be abandoned. Traffic can also cause nesting birds in the near vicinity of the road to abandon nests. Unpaved roads can modify surrounding habitat by serving as

predator corridors and can be a significant source of dust which reduces the viability and vigor of vegetation in sagebrush steppe habitat. Over time, dust can impact nesting habitat, adversely affect the viability of forbs in brood-rearing habitat, and reduce the amount of effective moisture available to plants. Dust from roads and other infrastructure disturbance areas can adversely affect several life cycle phases of insects (e.g., ants, beetles, grasshoppers, bees, wasps, etc.) that are important food sources for both passerines[64] and sage-grouse chicks.

A34 Sagebrush Steppe Conservation Measure A: Implement annual chemical dust control measures for high-use unpaved roadways within suitable sagebrush steppe habitat [1 point per 1/4 mile, maximum of 3 points]

CI or CI/CP Information:

- Identify and map suitable sagebrush steppe habitat and existing roads, including existing easements
- Identify dust control areas (taking existing easements into consideration) and map location indicating daily usage
- Specify details of selected dust control measures
- Commit to implement selected dust control measures

Performance Monitoring to Support Adaptive Management:

- Report details of selected dust control measures (when applied, how much, invoices or other documentation of dust control, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify effectiveness of dust control measures

A34 Sage-grouse Conservation Measure B: Establish formal commitments (including signage or active management methods) to close improved and two-track roads in Suitable Sage-grouse Habitat to all internal and external use (excluding monitoring and Unforeseen Circumstances) from March 1 to June 15 [5 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map existing roads and Suitable Sage-grouse Habitat, including existing easements
- Commit to establish formal commitments to close roads in Suitable Sage-grouse Habitat
- Provide signed surface use agreement with the Association specifying road closure details

Performance Monitoring to Support Adaptive Management:

- Report details of road closure efforts (effectiveness, response to restrictions, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify effectiveness of road closure efforts

A34 Sagebrush Passerine Conservation Measure C: Establish formal commitments (including signage or active management methods) to close improved and two-track roads in suitable sagebrush passerine habitat to all internal and external use (excluding monitoring and Unforeseen Circumstances) from March 15 to July 31 [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map existing roads and suitable passerine habitat, including existing easements
- Commit to establish formal commitments to close roads in suitable sagebrush passerine habitat
- Provide signed surface use agreement with the Association specifying road closure details

[64] Rotenberry (1980)

Performance Monitoring to Support Adaptive Management:

- Report details of road closure efforts (effectiveness, response to restrictions, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify effectiveness of road closure efforts

A34 Sagebrush Steppe Benefits: Reducing habitat modification and fragmentation from roads can maintain and potentially increase sagebrush obligate use capacity by favorably affecting nest establishment and success, brood rearing success, and/or winter use capacity. Other benefits include reduction of noise and human disturbance along the road within a critical distance of nesting and brood rearing habitat and the sage-grouse lek. These measures will also reduce dust in the vicinity of nesting habitat and the sage-grouse lek, potentially increasing canopy cover, insect availability, and habitat quality.

FACTOR B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

There is no recent evidence that sagebrush obligates are overutilized for any of these purposes.

FACTOR C: Disease and Predation.

Parasites and Diseases

C1 Sagebrush Steppe Threat: While a variety of parasites and diseases can affect sagebrush obligates, research has identified that one of the key lethal diseases is West Nile virus - particularly for sage-grouse. This virus is primarily transmitted by mosquitoes. Regional studies have shown that almost all birds affected by West Nile virus die within the season. Mortality due to West Nile virus represents losses in breeding and production capacity for regional sagebrush obligate populations.

C1 Sagebrush Steppe Conservation Measure A: Control mosquito larvae using *Bacillus thuringiensis* or appropriate chemicals in at least 75 percent of surface water impoundments (dikes, septic lagoons, etc.) under ownership-control within 5 mile radius of sage-grouse leks or a 1.5 mile[65] radius of identified sagebrush obligate nesting, brood-rearing, or fall habitat. Watershed issues must be considered if biological controls are used (e.g., fish must be species native to watershed/sub-basin unless system is closed as defined by WGFD, etc.) [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek locations and map sagebrush obligate summer and fall habitat
- GPS locations of existing surface water impoundments
- Measure baseline mosquito larvae abundance at each impoundment
- Specify details of mosquito larvae control including protection of fish and birds
- Commit to implement mosquito control measures

[65] Ciota et al. (2012)

Performance Monitoring to Support Adaptive Management:

- Report mosquito larvae abundance (test methods, date sampled, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report details of mosquito larvae control efforts (methods used, dates controlled, post treatment larvae abundance, invoices, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment status

C1 Sagebrush Steppe Conservation Measure B: Breach, drain from May 15 to September 15, or change structure of existing impoundments where mosquitoes are present (within a 1.5 mile radius of identified sagebrush obligate nesting, brood-rearing, or fall habitat) to reduce or eliminate mosquito larvae. Consideration must be given to use of impoundment by other wildlife species [2 points per impoundment depending on modification chosen]

CI or CI/CP Information:

- GPS sage-grouse lek locations and existing impoundments; map occupied sagebrush obligate areas
- Identify impoundment(s) to be removed or modified
- Commit to remove or modify identified impoundment(s)

One-time Compliance Monitoring:

- Report number of impoundments removed or modified to the Association by January 31
- For each removed or modified impoundment, provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will use aerial imagery (NAIP or comparable) at least once every 6 years to verify water facility status

C1 Sagebrush Steppe Conservation Measure C: Replace existing impoundment where mosquitoes are present (within a 1.5 mile radius of identified sagebrush obligate nesting, brood-rearing, or fall habitat) with a non-windmill equipped water source and breach impoundment. Consideration must be given to use of impoundment by other wildlife species [3 points per impoundment, maximum of 6 points]

CI or CI/CP Information:

- GPS sage-grouse lek locations and existing impoundments; map occupied sagebrush steppe areas
- Identify impoundment(s) to be removed
- Commit to remove identified impoundment(s)

One-time Compliance Monitoring:

- Report number of impoundments removed to the Association by January 31
- For each removed impoundment and replacement water source, provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Association staff will use aerial imagery (NAIP or comparable) at least once every 6 years to verify water facility status

C1 Sagebrush Steppe Conservation Measure D: Control mosquito larvae in stock water tanks with larvicide or completely drain tanks that aren't in use from May 1 to September 30 to discourage mosquito breeding [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS locations of existing stock tanks to be drained or treated
- Specify details of mosquito larvae control including protection of fish and birds
- Commit to implement mosquito larvae control
- Baseline mosquito larvae abundance at each tank to be treated

Performance Monitoring to Support Adaptive Management:

- Report mosquito larvae abundance (test methods, date sampled, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report details of mosquito larvae control efforts (methods used, dates controlled or date tank drained, post treatment larvae abundance, invoices, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment status

C1 Sagebrush Steppe Conservation Measure E: Chemically control mosquito larvae in new and used tire storage areas or in junk yards. For any tire recyclers utilized, arrange for application of mosquito larvae controls in stockpiled tires awaiting recycling [2 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS locations of tire storage areas or junk yards
- Baseline mosquito larvae abundance at each tire storage area or junk yard
- Specify details of mosquito larvae control including protection of fish and birds
- Commit to implement mosquito larvae control measures

Performance Monitoring to Support Adaptive Management:

- Report mosquito larvae abundance (test methods, date sampled, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report details of mosquito larvae control efforts (methods used, dates controlled or date tank drained, post treatment larvae abundance, invoices, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment status

C1 Sagebrush Steppe Benefits: The potential for mosquitoes to breed in standing water in surface impoundments, tires, and waste containers is relatively high. Larvicide treatments and draining of standing water will restrict these potential mosquito breeding areas. These controls will result in the reduction of overall mosquito numbers, corresponding to a reduced probability of West Nile virus infection of sage-grouse and passerines. This reduction in a mortality factor will maintain or increase sagebrush obligate production capacity for the region.

C2 Sagebrush Steppe Threat: While a variety of parasites and diseases can affect sagebrush obligates, research has identified that one of the key lethal diseases is West Nile virus - particularly for sage-grouse. This virus is primarily transmitted by mosquitoes. Regional studies have shown that almost all birds affected by West Nile

virus die during the season. Mortality due to West Nile virus represents losses in breeding and production capacity for regional sagebrush obligate populations.

C2 Sagebrush Steppe Conservation Measure A: Control adult mosquitoes through installation of bat houses in appropriate areas (e.g., around impoundments, riparian, greenbelts/tree windbreaks, etc.) utilizing designs that avoid establishment of a raptor perch site [1 point for 4 houses, maximum of 2 points]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek locations and suitable sagebrush steppe habitat
- GPS locations of planned bat houses showing likely mosquito sites
- Specify details of bat house design and placement
- Commit to implement installation of bat houses

One-time Compliance Monitoring:

- Photograph of each bat house

Performance Monitoring to Support Adaptive Management:

- Report details of bat recruitment efforts including presence/absence or number of bats utilizing houses to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify bat house installation

C2 Sagebrush Steppe Conservation Measure B: Discourage mosquito overwintering and breeding by managing containers and woodpiles (cover, chemically treat, etc.) [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS locations of container storage sites and woodpiles
- Specify details of mosquito breeding and overwintering controls
- Commit to implement mosquito controls as specified

Performance Monitoring to Support Adaptive Management:

- Report details of mosquito breeding and overwintering control efforts to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify control efforts

C2 Sagebrush Steppe Benefits: These mosquito controls will result in reduced probability of West Nile virus infection of sagebrush obligates. This reduction in a mortality factor will maintain or increase the production capacity for the region. Bats are extremely effective at capturing and consuming mosquitoes, and are a highly mobile and adaptive mosquito control tool. Snags, caves, overhangs, and other bat roosting habitats across the landscape are relatively limited. This measure will substantially increase the number and distribution of favorable bat roosting sites and will focus the additional sites on areas likely to have mosquitoes and likely to be utilized by sage-grouse. The additional bat habitat is expected to result in dispersed and increased bat populations with corresponding reductions in mosquitoes. In addition, chemical treatments and management actions that restrict overwintering and breeding use of containers and woodpiles (restrictive covers, water removal prior to breeding season, etc.) will further restrict potential mosquito breeding success.

Predation

C3 Sagebrush Steppe Threat: Predation causes the most direct mortality of sagebrush obligates throughout all phases of their life cycle. This is especially true where habitat quality is marginal. Common predators of adult

sage-grouse include golden eagles, red foxes, and bobcats. Juvenile sage-grouse are killed by a variety of predators including various diurnal raptors, ravens, badgers, red foxes, coyotes, and weasels. Nest predators for all sagebrush obligates include ravens, crows, magpies, badgers, weasels, skunks, and raccoons. Other potential predators for adult passerines include American kestrels, prairie falcons, and northern harriers. Additionally, domestic and feral dogs and cats are significant predators to sagebrush obligates in all stages of their life cycle and in all seasons, particularly in the vicinity of residential areas.

C3 Sagebrush Steppe Conservation Measure A: Remove or routinely burn as permitted (outside of seasonal activity restriction periods) existing dumps, landfills, or garbage piles within 4.3 miles[66] of Occupied Sage-grouse Leks or suitable sagebrush steppe habitat [2 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify Occupied Sage-grouse Lek locations and suitable passerine habitat; GPS dumps, landfills, or trash sites within 4.3 miles
- Identify individual trash sites which will be removed or routinely burned
- Commit to remove or routinely burn (as permitted) trash sites

One-time Compliance Monitoring:

- Report number of trash sites removed to the Association by January 31
- For each removed trash site, provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Report trash management details (dates of routine burn, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify trash disposal methods

C3 Sagebrush Steppe Conservation Measure B: Utilize waste disposal options which do not serve as attractants for predators (commercial trash pickup services, caged trash bins, etc.), particularly for those areas within 4.3 miles of Occupied Sage-grouse Leks or suitable sagebrush steppe habitat [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Document existing waste disposal methods
- Specify details of selected waste disposal option
- Commit to implement selected waste disposal option

Performance Monitoring to Support Adaptive Management:

- Report the waste disposal methods being utilized including any changes in waste disposal methods to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify waste disposal method

C3 Sagebrush Steppe Conservation Measure C: Remove existing brush piles and downed trees within 3 miles of Occupied Sage-grouse Leks and suitable passerine habitat [3 points for entire CI or CI/CP area]

[66] For those predator species with an ecological association with humans (including coyotes, red foxes, and raccoons for the region covered by this Strategy), Knick and Connelly (2011) have identified a 4.3 mile distance of influence around residential areas for potential sage-grouse impacts due to the foraging distances of the general group of human-associated mammalian and avian predators of sage-grouse. For this Strategy it is assumed that this distance of influence should also apply to potential impacts from domestic and feral dogs and cats around residential areas.

CI or CI/CP Information:

- Identify Occupied Sage-grouse Lek locations and suitable passerine habitat; GPS existing brush piles and downed trees within 3 miles
- Identify individual brush piles or trees that will be removed
- Commit to implement brush/tree removal

One-time Compliance Monitoring:

- Report number of brush piles or trees removed to the Association by January 31
- For each brush or tree removal site, provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP

C3 Sage-grouse Conservation Measure D: Remove standing dead trees within 1 mile of Occupied Sage-grouse Leks [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify Occupied Sage-grouse Lek locations and GPS standing dead trees within 1/4 mile
- Identify individual trees that will be removed
- Commit to remove identified trees

One-time Compliance Monitoring:

- Report tree removal details (number of standing dead trees removed, date(s) of treatment, etc.) to the Association by January 31
- For each tree removal site, provide before and after digital photographs from the same location, along with GPS coordinates of each photo point, to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site or use aerial imagery (NAIP or comparable) to verify tree removal status

C3 Sage-grouse Supporting Conservation Measure E: Develop and disseminate public education material on appropriate methods to reduce sage-grouse predation (e.g., habitat modifications, appropriate grazing practices to optimize nesting and brood-rearing habitat, etc. [1 point, maximum 3 points (18 points for small acreage owners) among this measure and all lack of education measures]

CI or CI/CP Information:

- Provide details of public education material: media type, target audience, distribution methods, etc.
- Commit to develop and disseminate public education materials

One-time Compliance Monitoring:

- Submit a copy of the public education material to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of public education material dissemination (pieces distributed, distribution locations, target audience response, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP

C3 Sagebrush Steppe Benefits: Reduction of predation may increase sagebrush obligate production capacity. This can be accomplished through minimizing preferred predator habitat and reducing anthropogenic features (e.g., roads and dumps) that attract predators. Educating people about sage-grouse predation issues will

encourage people to utilize appropriate methods and grazing practices that may benefit sagebrush steppe species.

FACTOR D: Inadequacy of Existing Regulatory Mechanisms.

Local Land Use Laws, Processes, and Ordinances

On- and Off-Road Use of Suitable Habitat

D1 Sagebrush Steppe Threat: Both on- and off-road vehicle use of sagebrush steppe habitat can cause physical disruption of sagebrush obligates, and noise from recreational and other vehicles can cause behavioral disruptions as well. This can cause sagebrush obligates to discontinue use of breeding areas, move into more marginal habitats resulting in reduced nesting and brood-rearing success and/or capacity of winter habitat, abandon nests, or be forced to utilize habitats more prone to predation of nests, broods or adult birds.

D1 Sagebrush Steppe Conservation Measure A: Establish surface use agreement with the Association (including signage or other active management methods) to prevent recreational vehicle use of lands from March 1 to June 15 for important sage-grouse breeding and nesting habitat, from June 15 to July 31 for important sagebrush obligate brood-rearing habitat, and from December 1 to February 15 for important sage-grouse winter habitat [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS sage-grouse lek locations and map suitable sagebrush steppe habitat
- Specify details of recreational vehicle use prevention efforts or reference signed agreement
- Commit to establish and implement surface use agreement

One-time Compliance Monitoring:

- Sign surface use agreement with the Association

Performance Monitoring to Support Adaptive Management:

- Report details of prevention efforts (effectiveness, response to restrictions, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify effectiveness of recreational vehicle use prevention efforts

D1 Sage-grouse Conservation Measure B: Move livestock on horseback or on foot and restrict the use of recreational vehicles and dogs for trailing and herding in Suitable Sage-grouse Habitat from March 1 - July 31 [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify GPS lek site locations and map Suitable Sage-grouse Habitat
- Specify details of livestock moving practices
- Commit to implement livestock moving practices

Performance Monitoring to Support Adaptive Management:

- Report details of livestock moving efforts (method used, effectiveness, sage-grouse flushed, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify livestock movement methods

D1 Sagebrush Steppe Benefits: Reduction of access and vehicular traffic will reduce related impacts to sagebrush obligate behavior and life cycle, and reduce the potential for the birds to be forced out of optimum habitat into marginal habitats. Ultimately, this will maintain or improve the potential for nesting and brood-rearing success and/or capacity of winter habitat.

Human Disturbance in Adjacent Near-lek Areas

D2 Sage-grouse Threat: Any human disturbance in the vicinity of the lek or associated nesting buffer during the breeding season can cause physical disruption of sage-grouse behavior, even if the lek is not on the participating member's property. This can cause sage-grouse to discontinue use of a lek or move into more marginal nesting habitats, resulting in reduced lek breeding success, nesting success, nest abandonment, and birds forced to utilize habitats more prone to predation of nests.

D2 Sage-grouse Conservation Measure: Minimize human disturbance in a 3[67] mile nesting buffer zone around Occupied Sage-grouse Lek sites by contacting the Association each January for current information about existing buffer zones, restrictions on activities within buffer zones, and viable alternatives to activities from March 1 - June 15 in nesting buffer zones outside the members CI or CI/CP area [maximum 2 points]

CI or CI/CP Information:

- Property map with GPS locations of known lek sites including those within 3 miles of the CI or CI/CP area
- Commit to minimize human disturbance in buffer zone

Performance Monitoring to Support Adaptive Management:

- Report details of efforts to minimize human disturbance (date of contact with the Association, effectiveness of alternatives, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP

D2 Sage-grouse Benefits: Disruption of lekking behavior by human disturbance can impact the breeding and nesting success probability, directly impacting sage-grouse populations. This measure addresses those risks by using information on leks and related nesting buffer zones to establish a non-disturbance zone relative to leks outside the participating members property during the critical lekking and nesting seasons. This will reduce related impacts to sage-grouse breeding behavior and will ultimately maintain or improve the potential for breeding and nesting success.

Recreational Lek Observations

D3 Sage-grouse Threat: Recreational lek observations can cause disruptions to sage-grouse breeding behavior. These can include disruptions due to the presence of the observers or noise from movements to and from the lek observation posts. Any or all of these disturbance factors can cause sage-grouse to discontinue use of a lek either temporarily or permanently, resulting in reduced breeding and subsequent productivity success.

D3 Sage-grouse Conservation Measure: Manage sage-grouse lek viewing impacts through establishment of lek viewing protocols for lands within the CI or CI/CP area [1 point for entire CI or CI/CP area]

CI or CI/CP Information:

- Identify and GPS sage-grouse lek site locations

[67] Holloran and Anderson (2005) found a majority (64 percent) of nests within 3.1 miles of the lek

- Determine leks that will be open for public viewing
- Specify details of lek viewing protocols using Wyoming Game & Fish Department's lek viewing guide as a basis, or reference filed protocol
- Commit to implement lek viewing protocols

One-time Compliance Monitoring:

- Provide lek viewing protocol to the Association by January 31 or as specified in the CI or CI/CP and prior to opening leks for public viewing

Performance Monitoring to Support Adaptive Management:

- Report details of lek viewing efforts (effectiveness, response to restrictions, etc.) to the Association by January 31 of each year or as specified in the CI or CI/CP

D3 Sage-grouse Benefits: Establishing specific protocols and controls on the numbers and activities of sage-grouse lek observers will help reduce negative impacts to sage-grouse breeding and production.

Split Estate

D4 Sagebrush Steppe Threat: Several agencies have defined effective regulatory mechanisms to address some or all of these sagebrush obligates as species of concern, including the Bureau of Land Management, US Forest Service, Office of Surface Mining, and Wyoming Department of Environmental Quality, among others. However, under split estate situations the effectiveness of mechanisms regulating sub-surface mineral activities can be reduced or negated, due to surface ownership and activities that are not subject to regulation. These situations can result in surface disturbance activities that can potentially decrease the availability of quality habitat resulting in reduced nesting and brood rearing success and/or winter use capacity.

D4 Sagebrush Steppe Conservation Measure A: Establish a cooperative management plan between surface owner and mineral rights owner that addresses site specific fragmentation issues and maintains or enhances sagebrush steppe habitats; submit that plan to the Association for review and approval [up to 7 points depending on number of species and area covered; applicable to each party]

CI or CI/CP Information:

- Identify proposed cooperative management plan participants and provide map
- Commit to establish and implement cooperative management plan

One-time Compliance Monitoring:

- Develop and sign a cooperative management plan between surface and mineral rights owners 5 years of CI or CI/CP signing
- Submit a signed copy of the cooperative management plan to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Report actions taken to ensure coordination between surface and mineral right owners and specific management actions taken to benefit sagebrush obligates to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify coordination and management actions

D4 Sagebrush Steppe Conservation Measure B: Establish a cooperative management plan between grazing permittee and the appropriate land management agency that addresses site specific fragmentation issues and maintains or enhances sagebrush steppe habitats; submit that plan to the Association for review [up to 7 points depending on number of species and area covered]

CI or CI/CP Information:

- Identify proposed cooperative management plan participants and provide map
- Commit to establish and implement a cooperative management plan

One-time Compliance Monitoring:

- Develop and sign a voluntary cooperative management plan between grazing permittee and the appropriate land management agency within 5 years of CI or CI/CP signing
- Submit a signed copy of the voluntary cooperative management plan to the Association by January 31 or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Report actions taken to ensure coordination between grazing permittee and the appropriate land management agency and specific management actions taken to benefit shortgrass species to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify coordination and management actions

D4 Sagebrush Steppe Benefits: Establishing a cooperative management plan to coordinate surface owner and mineral right owner and/or grazing permittee and federal land management agency responsibilities will reduce surface disturbance activities that can potentially decrease the availability of quality habitat. This will increase nesting and brood rearing success and/or improve winter use capacity.

FACTOR E: Other Natural or Manmade Factors Affecting the Species' Continued Existence.

Drought

Damage to Existing Green Areas

E1 Sagebrush Steppe Threat: Disturbance of riparian, wetland, and greenbelt areas can negatively impact water flow patterns and volumes, as well as negatively impact green area vegetation growing on these sites. This reduces the number and quality of existing green areas, negatively impacting the availability and quality of brood-rearing habitat. These reductions in key foraging areas would reduce brood-rearing and nesting success.

E1 Sagebrush Steppe Conservation Measure: Reduce sedimentation by stabilizing head cuts on ephemeral draws in suitable sagebrush steppe habitat [1 point for each head cut, maximum of 4 points]

CI or CI/CP Information:

- Identify and map suitable sagebrush steppe habitat
- Commit to reduce sedimentation through stabilization
- GPS locations of existing head cuts which will be stabilized and method of stabilization

- Establish baseline photo points during growing season with GPS locations: 1 downstream from each head cut

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph head cut areas annually within ± 3 weeks of baseline photograph; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify treatment area trend

E1 Sagebrush Steppe Benefits: Reducing head cut sedimentation will maintain and potentially increase the availability and quality of brood-rearing habitat. The protection and enhancement of these important foraging areas will maintain or increase nesting and brood-rearing success by providing additional habitat areas for forb food source development and will increase substrates for additional insect populations.

Lack of Suitable Water Availability

E2 Sagebrush Steppe Threat: The availability and distribution of water sources in the Coverage Area are limited and often are unsuitable for use by sagebrush obligates. For example, stock watering tanks are used extensively throughout northeast Wyoming but, without appropriate escape ramps, sagebrush obligates and other wildlife can become trapped within these tanks and drown. Poorly designed livestock barriers can also create hazards for sage-grouse and other wildlife. In addition to direct mortality, these water limitations could impact the condition of adult females and broods, consequently having a negative impact on nesting and brood-rearing success.

E2 Sagebrush Steppe Conservation Measure A: Establish guzzlers or other ground level watering points in suitable sagebrush steppe habitat and protect from trampling using wildlife friendly fencing or other measures [1 point for each, maximum of 4 points]

CI or CI/CP Information:

- GPS location of existing sage-grouse leks and map suitable sagebrush steppe habitat
- Identify location of guzzler(s) or other ground level watering points to be developed
- Commit to establish guzzler(s) or other ground level watering points at identified location(s)
- Establish baseline photo points with GPS locations: 1 per watering point

One-time Compliance Monitoring:

- Report number of guzzler(s) or other ground level watering points installed to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- At each established photo point, photograph guzzler(s) or other ground level watering points annually; provide digital photograph(s) to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify watering point status

E2 Sagebrush Steppe Conservation Measure B: Install and maintain Association approved escape ramps and livestock barriers in all stock tanks [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS location of existing stock tanks
- Identify location of stock tanks where new escape ramps or livestock barriers are needed

- Commit to install and maintain escape ramps or livestock barriers as identified

One-time Compliance Monitoring:

- Report number of escape ramps or livestock barriers installed to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Report any changes in escape ramp numbers or status to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report any wildlife mortalities to the Association within 30 days of discovery
- Association staff will visit the site at least once every 4 years to verify escape ramp and livestock barrier status

E2 Sagebrush Steppe Conservation Measure C: Remove previously approved but poorly designed escape ramps and livestock barriers in all stock tanks (those found to be ineffective in providing escape for trapped animals or with designs that create other hazards). Install and maintain Association approved escape ramps and livestock barriers in all stock tanks [3 points for entire CI or CI/CP area]

CI or CI/CP Information:

- GPS location of existing stock tanks
- Identify stock tanks where replacement escape ramps or livestock barriers are needed
- Commit to install and maintain escape ramps or livestock barriers as identified

One-time Compliance Monitoring:

- Report number of escape ramps or livestock barriers replaced to the Association by January 31 of each year or as specified in the CI or CI/CP

Performance Monitoring to Support Adaptive Management:

- Report any changes in escape ramp numbers or status to the Association by January 31 of each year or as specified in the CI or CI/CP
- Report any wildlife mortalities to the Association within 30 days of discovery
- Association staff will visit the site at least once every 4 years to verify escape ramp and livestock barrier status

E2 Sagebrush Steppe Benefits: Establishing and protecting small-scale guzzler water sources will provide focused flowing water for use by sagebrush obligates. Providing improved escape structures will restore the means for sagebrush obligates and other wildlife to escape from stock tanks, minimizing or eliminating the threat of drowning. This will result in reduced threats of sagebrush obligate mortality in the area. In addition, these improved water sources will maintain or improve the condition of nesting birds and broods, increasing nesting and brood-rearing success.

Use of Insecticides

E3 Sagebrush Steppe Threat: Insecticides, particularly carbofuran insecticides, can result in reduced food sources, direct mortality, and reduced population productivity. Grasshoppers and other insects are utilized by all sagebrush obligates so grasshopper control programs can exacerbate these threats.

E3 Sagebrush Steppe Conservation Measure A: Commit to not using carbofuran insecticides on the enrolled acres [4 points for entire CI or CI/CP area]

CI or CI/CP Information:

- Map current sagebrush obligate use areas
- Document likelihood of new carbofuran insecticide use if not for the agreement to implement the Conservation Measure
- Commit to not use carbofuran insecticides on enrolled acres
- Document use of carbofuran insecticides on enrolled acres during previous 5 years

Performance Monitoring to Support Adaptive Management:

- Provide details of any carbofuran insecticide use; report use or submit a "no use of carbofuran insecticide" statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify status of carbofuran insecticide programs

E3 Sagebrush Steppe Conservation Measure B: Commit to utilizing the Reduced Area & Application Treatments (RAATs) approach for all insecticide spraying on enrolled acres [6 points on entire CI or CI/CP area]

CI or CI/CP Information:

- Document likelihood of new grasshopper control and other insecticide spraying if not for the agreement to implement the Conservation Measure
- Document grasshopper control and insecticide spraying on enrolled acres during previous 5 years
- Commit to using RAATs for all insecticide spraying

Performance Monitoring to Support Adaptive Management:

- Provide details of grasshopper control and insecticide spraying; report use or submit a "no grasshopper control and insecticide spraying "statement to the Association by January 31 of each year or as specified in the CI or CI/CP
- Association staff will visit the site at least once every 4 years to verify status of grasshopper control and insecticide spraying programs

E3 Sagebrush Steppe Benefits: Reducing the chance of secondary poisoning from insect control programs will improve life cycle performance and increase overall production success.

Outreach and Education Needs

E4 Sagebrush Steppe Threat: Since sagebrush obligate life cycles, including variations across regions, are relatively complex and not completely understood, well-meaning members of the public can frequently have negative impacts on these species without knowing those impacts are occurring. In addition, details on life cycle habitat needs of sagebrush obligates, and the specific locations of suitable sagebrush steppe habitat in the region, are not general knowledge. Potential negative impacts can include habitat fragmentation, human disturbance, and practices that increase the probability or distribution of West Nile virus vectors, among others. These impacts can cause sagebrush obligates to move into more marginal habitats resulting in reduced nesting, brood-rearing success, and/or capacity of winter habitat; and abandon nests or be forced to utilize habitats more prone to predation of nests, broods, or adult birds.

E4 Sagebrush Steppe Conservation Measure A: Work cooperatively with community naturalists, conservation districts, and others to develop and fund two media spots describing items of interest including the Association's conservation commitments and programs, outlining sagebrush obligate benefits and steps for ranchette

management, habitat fragmentation avoidance, road closures, weed control, etc. [1 point for 2 spots, maximum 3 points (18 points for small acreage owners) among C3E and all E4 measures]

CI or CI/CP Information:

- Provide details of public education material (media type, target audience, subject matter, distribution methods, etc.)
- Commit to work cooperatively to develop and place media spots

One-time Compliance Monitoring:

- Submit a copy of the educational material to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of any education material dissemination (distribution locations, media impressions, target audience response, etc.) that occurred within the year to the Association by January 31 or as specified in the CI or CI/CP

E4 Sagebrush Steppe Conservation Measure B: Work cooperatively with conservation districts to sponsor two Small Acreage Workshops or "welcome packets" focusing on sagebrush steppe habit including avoiding/addressing habitat fragmentation, need for weed control, and other positive steps for ranchette owners [1 point for 2 workshops/packets, maximum 3 points (18 points for small acreage owners) among C3E and all E4 measures]

CI or CI/CP Information:

- Provide details of public education material (media type, target audience, subject matter, distribution methods, etc.)
- Commit to sponsor workshops or develop and distribute “welcome packets”

One-time Compliance Monitoring:

- Submit a copy of the educational material to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of any education material dissemination (distribution locations, media impressions, target audience response, etc.) that occurred within the year to the Association by January 31 or as specified in the CI or CI/CP

E4 Sagebrush Steppe Conservation Measure C: Commit to develop and present sagebrush obligate related information in classrooms, meetings, etc. [1 point per activity, maximum 3 points (18 points for small acreage owners) among C3E and all E4 measures]

CI or CI/CP Information:

- Provide details of education material (media type, target audience, subject matter, distribution methods, etc.)
- Commit to develop and present sagebrush information

One-time Compliance Monitoring:

- Submit a copy of the educational material to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of any education material dissemination (distribution locations, media impressions, target audience response, etc.) that occurred within the year to the Association by January 31 or as specified in the CI or CI/CP

E5 Sagebrush Steppe Conservation Measure D: Develop/sponsor programs on sagebrush steppe habitat including impacts of fragmentation and benefits of weed control; provide to area school agriculture and education programs with sufficient quality to be adopted by three teachers in the same or different school [1 point per program, maximum 3 points (18 points for small acreage owners) among C3E and all E4 measures]

CI or CI/CP Information:

- Provide details of education material (media type, target audience, subject matter, distribution methods, etc.)
- Commit to develop/sponsor education programs

One-time Compliance Monitoring:

- Submit a copy of the educational material to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of any education material dissemination (distribution locations, media impressions, target audience response, etc.) that occurred within the year to the Association by January 31 of each year or as specified in the CI or CI/CP

E4 Sagebrush Steppe Conservation Measure E: Sponsor/host outreach activities (e.g., informational meetings, workshops, school tours, etc.) dealing with sagebrush steppe habitat for educators and their classes and the interested public [1 point per activity, maximum 3 points (18 points for small acreage owners) among C3E and all E4 measures]

CI or CI/CP Information:

- Provide details of outreach activities (outreach type, target audience, subject matter, distribution methods, etc.)
- Commit to sponsor/host outreach activities

One-time Compliance Monitoring:

- Submit a copy of any outreach materials to the Association by January 31 or as specified in the CI or CI/CP

Reporting Requirements

- Report details of any outreach activities (locations, media impressions, target audience response, etc.) that occurred within the year to the Association by January 31 or as specified in the CI or CI/CP

E4 Sagebrush Steppe Benefits: Actively participating in development of sagebrush obligate informational messages in a form crafted for the respective audiences and partnering with entities that have a broad audience will increase the general public knowledge about sagebrush obligates. The messages will incorporate vital information on sagebrush obligate life cycle and habitat needs and will allow listeners to make educated decisions about their actions in sagebrush habitat. This will help reduce negative impacts to breeding, production, and/or wintering success.

Conservation Measures Sorted by Point Value

The below table is provided as a summary table of point values for the Conservation Measures described in detail preceding the table. The table is not intended to fully describe the requirements of each Conservation Measure.

Item	Factor Area Topic	Conservation Measures Summary	Point Value	Page
A8b		commit to reducing facilities within 6/10mi or 1mi of lek	1	14
A9a		remove fences near leks and in suitable habitat	1	16
A9b		mark fences	1	16
A9c		avoid new fences within 6/10mi or 1mi of leks and other suitable habitat	1	17
A16e		control invasive or noxious weeds on rural homesites	1	32
A17b		increase soil saturation by installing snow fences to deposit snow in or near ephemeral draws	1	33
A17d		increase soil saturation by reducing output of alluvial wells	1	34
A20a		close & reclaim existing roads within 3mi of leks or 1-1/4mi of suitable passerine habitat	1	37
A21b		keep native habitat on ≥ 60% of existing homesites	1	39
A22a		suppress all wildfires in suitable habitat	1	40
A23		retrofit existing windmills and remove windmill towers within 1mi of leks & suitable habitat	1	41
A24a		delay cutting and baling activities until after July 31	1	42
A24b		reduce mortality by changing harvest techniques	1	42
A26		protect seedling sagebrush from big game / from big game & rabbits	1	44
A27a		decrease sagebrush canopy through focused winter feeding in suitable habitat (sage-grouse)	1	45
A28b		restrict surface disturbance activities within 3mi of leks from 3/1 - 6/15	1	47
A28c		limit noise to 10dBA above ambient measured at lek perimeter from 3/1 - 5/15, 6pm-8am	1	48
A34a		implement annual dust control within suitable habitat	1	55
C2a		build bat houses to encourage bat populations which aid in mosquito control	1	59
C3d		remove standing dead trees within 1mi of active leks	1	61
C3e		develop and disseminate public education material on methods to reduce sage-grouse predation	1	61
D1b		move livestock on horseback or on foot (restrict use of dogs) in suitable habitat	1	62
D3		manage lek viewing impacts by establishing lek viewing protocols	1	63
E1		reduce sedimentation on ephemeral draws by stabilizing head cuts in suitable habitat	1	65
E2a		establish guzzlers or other ground level watering sources	1	66
E4a		develop and fund two media spots describing conservation programs	1	68
E4b		work with Conservation Districts to sponsor two Small Acreage Workshops	1	69
E4c		develop and present sagebrush obligate related information in classrooms	1	69
E4d		develop material on impacts of fragmentation and benefits of weed control and provide to teachers	1	70
E4e		sponsor outreach activities for educators and their classes along with interested public	1	70
A2		increase and sustain extent of sagebrush/forb mosaic reestablishment - double approved	2	8
A8a		avoid siting facilities within 6/10mi or 1mi of lek	2	14
A10c		protect, enhance or restore habitat linkages between 320 acre minimum blocks	2	18
A11a		map and protect suitable habitat	2	19
A11c		identify and enhance sagebrush stands to create suitable habitat	2	20
A11d		treat Russian thistle in areas of suitable habitat and reseed as necessary	2	21
A12a		map and protect suitable habitat	2	22
A12c		identify and enhance sagebrush stands to create suitable habitat	2	23
A12d		establish in-fill or peripheral sagebrush areas	2	23
A13a		map and protect suitable habitat	2	24
A13c		identify and enhance sagebrush stands to create suitable habitat	2	25
A17a		increase soil saturation while avoiding standing water by developing new water sources	2	32
A17c		increase soil saturation by installing water detention (spreader) structures in ephemeral draws	2	33
A17e		develop additional water sources (a-d) and reseed areas with native forbs	2	34
A28a		avoid new surface occupancy within 6/10mi of leks & disturbance within 6/10mi of leks from 3/1-5/15, 6pm-8ar	2	47
A29a		seed disturbed and reclaimed areas with native seed mix	2	48
C1b		control mosquito larvae by breaching, changing, or draining impoundments	2	57
C1e		control mosquito larvae in tire storage areas or junkyards	2	58
C3a		remove or routinely burn existing dumps, landfills, or garbage piles within 4.3mi suitable habitat	2	60
D2		minimize human disturbance within 3mi of leks from 3/1 - 6/15	2	63
A3		substitute native sagebrush grassland seed mix in lieu of post-mine improved pasture seed mix	3	9
A7a		collect sighting & pellet count information and provide to TBGPEA for dissemination	3	12
A11b		map and protect habitat with known breeding activity	3	20
A12b		map and protect habitat with known breeding activity	3	22
A13b		map and protect habitat with known breeding activity	3	25
A14d		place attractants in upland locations which minimize impact to sagebrush steppe habitat	3	27
A14e		utilize public hunting access to manage wildlife numbers and associated habitat conditions	3	28
A16c		remove pine, juniper, or non-sagebrush shrubs within 1/4 mile of documented habitat	3	31
A16d		control invasive plants other than cheatgrass in a managed area of at least 320 acres	3	31
A18a		protect seeps, springs, and sub-surface irrigation areas from excessive herbivore use	3	35
A22b		within 1 year after wildfires, control invasives & reseed if necessary	3	40

Conservation Measures Sorted by Point Value

The below table is provided as a summary table of point values for the Conservation Measures described in detail preceding the table. The table is not intended to fully describe the requirements of each Conservation Measure.

Item	Factor Area Topic	Conservation Measures Summary	Point Value	Page
A27b		seed desirable native forbs and cool-season grasses in suitable habitat (sage-grouse)	3	46
A31		commit to appropriate wind & water erosion control above and beyond regulatory requirements	3	52
A33a		avoid prescribed fires within 6mi of known leks and 1-1/4mi of known passerine habitat	3	53
C1c		control mosquito larvae by breaching impoundments and replacing with water well	3	57
C1d		control mosquito larvae by treating or draining all stock tanks not in use from 5/1 - 9/30	3	58
C2b		discourage mosquito overwintering and breeding in containers and woodpiles	3	59
C3b		utilize non-attractant waste disposal methods, particularly for areas within 4.3mi suitable habitat	3	60
C3c		remove brush piles and downed trees within 3mi of suitable habitat	3	60
E2b		install and maintain TBGPEA approved wildlife escape ramps and livestock barriers	3	66
E2c		replace existing, poorly designed ramps and barriers with TBGPEA approved ramps and barriers	3	67
A6a		decrease new well pad size by average 20% in suitable habitat	4	11
A7b		conduct studies and other research on sagebrush steppe species & provide to TBGPEA	4	13
A16a1		control cheatgrass within a 320 acre block or 10% of CI or CI/CP area if less than 1,000 acres	4	29
A16b		control salt cedar and/or Russian olive within drainage areas	4	30
A18b		place attractants at least 1/4mi from riparian habitats, springs, seeps, or green areas	4	35
A30a		separate topsoil during construction of facilities (operators)	4	50
A30b		obtain surface damage agreements that require topsoil separation (landowners)	4	51
A32		sign surface damage agreements requiring invasive species control & reclaim with native seed mix	4	52
A34c		close roads and two tracks from 3/15 - 7/31 in suitable habitat	4	55
C1a		control mosquito larvae in > 75% of water impoundments within 5mi of leks or 3mi suitable habitat	4	56
D1a		sign agreement that prevents recreational use during key sagebrush obligate life cycle activities	4	62
E3a		commit to not using carbofuran insecticides	4	67
A6b		use drill pad mats on all level sites in suitable habitat	5	12
A8c		avoid siting facilities within suitable habitat	5	15
A8d		commit to reducing facilities within suitable habitat	5	15
A10b		obtain or donate acreage for use as a grass bank with a minimum 10 year term	5	18
A20b		avoid building new roads within 6/10mi of suitable habitat	5	38
A25a		avoid new surface occupancy/disturbance within 6/10mi or 1 mi of leks from 3/1-5/15, 6pm-8am	5	43
A25b		for nests within 3mi of lek; avoid surface disturbance within 6/10mi or 1 mi from 3/1-5/15, 6pm-8am	5	43
A29b		develop and field test seed mixes	5	49
A34b		close roads and two tracks from 3/1 - 6/15 in suitable habitat	5	55
A1a		bring disturbed lands to desired condition, encourage sagebrush-grasslands species	6	7
A1b		commit to no new conversion of sagebrush to cropland	6	7
A4		incorporate landscape scale sagebrush obligate lifecycle needs into mine reclamation plan	6	10
A19a		site distribution and transmission lines ≥ 0.6mi or 1mi from suitable habitat (operators)	6	36
A19b		sign surface use agreement avoiding power lines within 0.6mi or 1mi of suitable habitat (landowners)	6	36
A21a		commit to preserving existing land configuration, no new subdivisions, etc.	6	39
E3b		commit to RAATS for all insecticide spraying within CI or CI/CP area	6	68
A14a		develop and follow a high structure grazing management plan approved by TBGPEA	7	26
A16a2		control cheatgrass (A16a1) and reseed with native sagebrush steppe seed mix	7	30
D4a		sign a cooperative management plan between surface and mineral rights owner	7	64
D4b		sign a cooperative management plan between grazing permittee & federal land management agency	7	65
A10a		obtain or donate conservation easements with minimum 10 year term	8	17
A14b		develop and sponsor a high structure grazing management plan approved by TBGPEA	8	27
A15		manage for ≥ 6" residual vegetation height from 4/1 - 6/15 in nesting habitat	8	28
A19c		move or bury existing power lines within 6/10mi or 1mi of suitable habitat	8	37
A29c		develop and fund a custom grow program for sagebrush and forb seeds	8	49
A33b		use site-specific prescribed burn plans approved by TBGPEA within 6mi of leks, control invasives	8	53
A5		limit surface disturbance to 5% of suitable habitat per 640 acres	9	11
A14c		develop and follow an approved grazing management plan for entire ranch	10	27