

# GRASSLANDS ALLIANCE STANDARD

## Supporting Sustainability in Beef Cattle and Bison Grazing Operations in North America

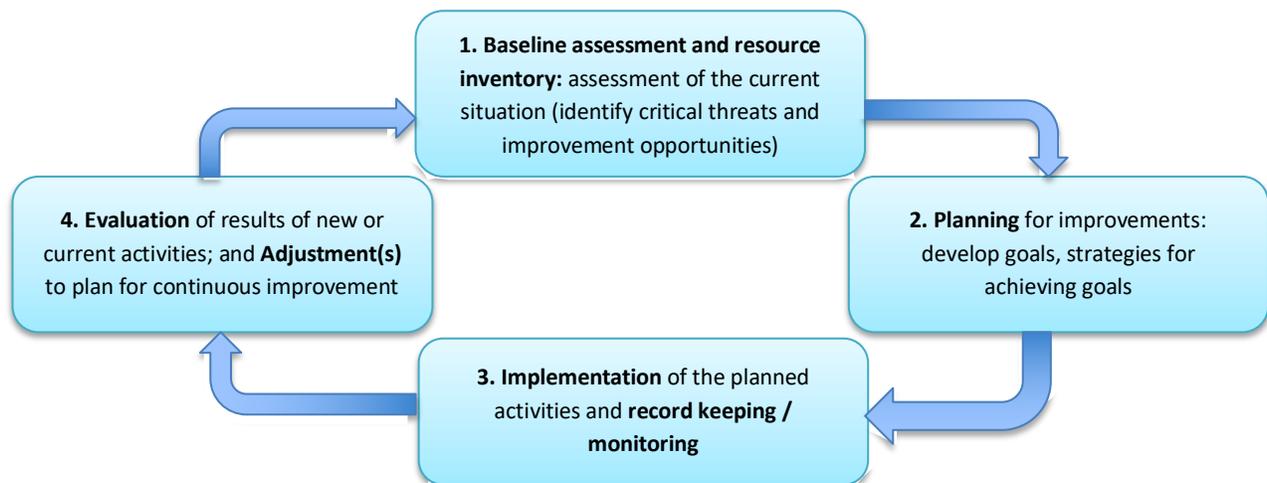
(Cow-Calf, Backgrounder, Stocker, Grass-Finishing Operations, including on-property feed crop lands and small animal-feeding facilities)

“By starting with the land, and seeking first to understand its functions and services, we can then ask how best do animals fit here, or do they even fit at all? Thus we might tune the livestock to the land, not the land to the livestock...The ‘place’ lens: Before you can know how to best manage livestock you need to first look to see where you are.” – H.H. Janzen<sup>1</sup>

### Principle 1: Effective Planning & Management System

*Beef production is based on an integrated ranch/farm management plan that is completed, implemented, monitored, and updated to address the environmental, economic and social risks associated with current and future production, appropriate to the scale of the operation.*

**Objectives and outcomes of Principle 1:** To establish a continuous improvement management cycle on the operation, an integrated ranch/farm planning and management system is implemented with the below four components:



The planning process follows a logical sequence in which an assessment of current conditions and conservation targets is completed and compared to historic conditions in order to understand the short and long-term impacts and benefits of management, and to determine where management improvements and/or restoration may be warranted. Management approaches are then developed, implemented, monitored and, where needed, adjusted to minimize and mitigate these impacts. All operations are required to implement this adaptive management planning cycle based on the requirements specified in Criteria 1.1 through 1.8. This will result in increased productivity and efficiencies of input use, reductions in

environmental impacts and greenhouse gas emissions, and proactive adaptation to climate change by specifying options of better management practices (BMPs) to achieve goals.

Meeting Principle I by demonstrating effective planning and adaptive management is designed to produce triple bottom line benefits that enable operations to realize the full ecological and economic potential of their land and water resources<sup>2</sup>. For example, many sustainable ranching success stories have shown that planning and implementation of grazing management at the ranch scale is critical for maintaining the natural resource base, habitat quality and biodiversity required to sustain both livestock production and other valuable ecosystem services, including opportunities to generate revenues through agritourism and other outdoor recreation-based opportunities<sup>3</sup>. In addition, demonstrating that beef is produced by verified well-managed operations is rapidly becoming important in the marketing of “sustainable”, “grass-fed” and “natural” products and can help boost an operation’s brand reputation and sales in these growing market sectors<sup>4</sup>.

Criteria	Indicators
<p><b>1.1</b> A baseline assessment for the operation is documented. The baseline assessment is used to document existing conditions, and to provide a benchmark for use in measuring progress on improvements to the operation. It is reviewed annually, with new information added as relevant. The baseline assessment includes:</p> <ul style="list-style-type: none"> <li>• A ranch/farm map or sketch;</li> <li>• Information on each production area.</li> <li>• Additional site-specific information and resources pertaining to compliance with Grasslands Alliance standards, including:               <ul style="list-style-type: none"> <li>• <u>Risks to ranch/farm from production (identified issues of concern);</u></li> <li>• <u>Improvement opportunities / corrective actions</u> planned and/or implemented to address issues of concern;</li> </ul> </li> </ul> <p><i>Critical Criterion</i></p>	<ul style="list-style-type: none"> <li>a) The assessment and resource inventory compiles and evaluates baseline information on existing conditions within all owned and leased lands of the operation proposed for continuous improvement and/or certification.</li> <li>b) The ranch/farm map or sketch indicates the following:               <ol style="list-style-type: none"> <li>1) Location of each management unit, roads, buildings, infrastructure, fences and cropland;</li> <li>2) Streams, <u>water bodies</u> and water sources;</li> <li>3) <u>Natural ecosystems</u>, management designation for all natural ecosystems (strict preservation, restoration, or sustainable management), and <u>High Conservation Value areas</u>;</li> <li>4) <u>Grazing management areas</u>;</li> <li>5) <u>Marginal lands</u></li> <li>6) Abutting land uses, including protected areas; and</li> <li>7) The total ranch/farm area, including of acreage of grazing management areas and pastures, croplands, and natural ecosystems on all owned and leased lands.</li> </ol> </li> <li>c) The written assessment includes:               <ol style="list-style-type: none"> <li>1) Forage inventory - pasture and crop production records that are covered by the Grassland Alliance scope for the next production cycle</li> <li>2) Current pasture/rangeland condition</li> <li>3) Herd description</li> <li>4) Ecological description (physical and biological characteristics) of the operation, including:                   <ol style="list-style-type: none"> <li>i. Climate</li> <li>ii. Altitude range</li> <li>iii. Soil description: Soil survey conducted at the appropriate property and management unit(s) proposed, including use of data from soils maps where available and recent soil test results for croplands.</li> </ol> </li> </ol> </li> </ul>

	<ul style="list-style-type: none"> <li>iv. Existing wildlife habitats and aquatic ecosystems;</li> <li>v. Plant communities including natural vegetation cover/plant communities;</li> <li>vi. Rare species and communities;</li> <li>5) The <u>Ecological Site Description(s)</u> (ESD) and/or <u>Forage Suitability Group Description(s)</u> (FSGD) covering the operation (where available);</li> <li>6) Condition of structural improvements such as fences and water developments (including seasonal availability and quality of watering sites); and</li> <li>7) Past and current land and water conservation activities, including land use history relevant to current issues of concern.</li> <li>d) For improved pasture, grazed croplands, and on-farm feed cropland, crop information (per management unit, as indicated in the map) including: <ul style="list-style-type: none"> <li>1) Type of forage and/or crop(s);</li> <li>2) Crop varieties and density;</li> <li>3) Crop age or renovation stage for perennial crops;</li> <li>4) Rotation cycle for all crops.</li> </ul> </li> <li>e) Additions to the original baseline assessment may include: <ul style="list-style-type: none"> <li>1) Documented implementation of science-based conservation practices and safeguards related to beef producing operations, or other proven-effective practices.</li> <li>2) Results on <u>Rangeland Health Assessments</u> and/or <u>Pasture Condition Scoring</u> and other recent assessments accepted by Grasslands Alliance and conducted within the past two years.</li> </ul> </li> </ul>
<p><b>1.2</b> An Operations Plan is developed and implemented, and updated annually. The plan aims to achieve positive outcomes for the triple bottom line, and documents steps to optimize <u>productivity</u>, input use efficiency, and compliance with Grasslands Alliance standards</p> <ul style="list-style-type: none"> <li>• The producer/manager identifies priorities (goals) and describes management objectives or options for the operation proposed for continuous improvement and/or certification, based upon the results of the baseline (and if available, most recent) assessment.</li> </ul>	<ul style="list-style-type: none"> <li>a) The Operation Plan includes the following: <ul style="list-style-type: none"> <li>1) Herd description including number and class of animals and pasture and crop production records that are covered by the Grassland Alliance scope for the next production cycle;</li> <li>2) Planned water use, energy consumption, and labor requirements;</li> <li>3) Additional defined planning and corrective actions to address non-compliances with each <b>Critical Criterion CC+3</b> of this Grasslands Alliance standard; and</li> <li>4) Timeline and resources for each proposed action, and the personnel responsible for their implementation.</li> </ul> </li> <li>b) For the contingency plan: <ul style="list-style-type: none"> <li>1) The operation can demonstrate a plan to maximize resilience to potential risks, including: climate change, extreme weather (e.g., severe drought, flooding, extreme cold or heat) and unexpected events (e.g., wildfire, insects, pests, floods). The plan describes potential weather-related risks and impacts to forage and water resources, and outlines alternative management that would be instituted if these conditions occur.</li> <li>2) The <u>forage-animal balance</u> contains a buffer adequate to meet feed requirements in the face of unexpected events.</li> </ul> </li> </ul>

<p>A <u>contingency plan</u> details potential risks to production and serves as a guide for adjusting the operation management plan to maximize <u>resilience</u>, and minimize impacts and resource degradation due to <u>unexpected events</u>, including <u>adaptations</u> for reducing impacts of climate change.</p> <p>When the operation initiates any major <u>conversion</u> of grasslands and other natural ecosystems, new planting, or any major new farm infrastructure development, an independent environmental and social assessment is conducted prior to the development or when required by applicable laws.</p> <p><i>Critical Criterion CC+3</i></p>	<p>3) A technical assistance specialist has assisted with identifying and developing locally appropriate strategies for optimizing the resistance and resilience of the operation to extreme weather and climate change risks and other potential problems.</p> <p>c) For land conversion assessments, the assessment is conducted in accordance with applicable laws, or, in their absence, based on technically recognized methods, and addresses at least the following topics: <u>biodiversity</u>, water, ecosystem services, soils, resulting greenhouse gas emissions and other air pollutants (e.g., dust), <u>waste</u>, land and resource rights, tenure and conflicts, food security, and other adverse impacts on local <u>communities</u>.</p> <p>1) The assessment includes written plans and procedures for:</p> <ul style="list-style-type: none"> <li>i) Minimizing and mitigating any negative impacts;</li> <li>ii) Enhancing positive impacts (I.e., benefits);</li> <li>iii) Implementing and monitoring the specified environmental and social management measures during the installation and operation phases of the new development.</li> </ul>
<p><b>1.3</b> An integrated pest management plan (IPM) that prioritizes pest prevention and reduction of the use of pesticides is documented and updated at least once per year.</p> <p><i>Critical Criterion CC+3</i></p> <p>NOTE: Compliance with 1.3 is met when filling out all information required by the “Grasslands Alliance Integrated Pest Management Plan template”.</p>	<p>a) The IPM plan is specific to the ranch, its relevant rangeland vegetation and/or pasture forage crops, pests &amp; location.</p> <p>b) The IPM plan identifies:</p> <ul style="list-style-type: none"> <li>1) Monitoring and recordkeeping activities, including <ul style="list-style-type: none"> <li>i. Monitoring of pests to identify their presence during periods of crop susceptibility, assess trends and risks associated with climate change, and determine pest management steps;</li> <li>ii. Monitoring vegetation and forage health;</li> <li>iii. Identification of economically and ecologically acceptable pest, disease, weed and invasive species incidence thresholds, and pest control measures are defined based on these thresholds.</li> </ul> </li> <li>2) Pest prevention activities, including <ul style="list-style-type: none"> <li>i. Non-chemical pest prevention means for limiting pest introduction to the operation, to avoid favoring pests, to prevent pest spread between pastures and fields and into neighboring natural areas, and to prevent pest reservoirs from developing;</li> <li>ii. Avoidance of pest-susceptible crops for annual systems, as these plants are more attractive or susceptible to pests</li> <li>ii) A combination of management interventions to avoid reliance solely on pesticides, where pest risks are evident from monitoring: <ul style="list-style-type: none"> <li>a. Cultural practices that suppress pest growth;</li> <li>b. Physical practices that damage or remove the pest;</li> <li>c. Biological practices that increase pest mortality from predators, parasites or pathogens; or</li> <li>d. Low risk chemical practices.</li> </ul> </li> </ul> </li> </ul>

	<p>3) Activities to protect and conserve wild and domesticated crop pollinators and the parasites and predators of crop pests.</p>
<p><b>1.4</b> A Cattle Herd Health Plan is established and implemented to prevent and minimize disease. Alternatively, the operation can demonstrate participation in a GA accredited herd health program (with appropriate records). <i>Critical Criterion CC+3</i></p>	<p>a) The plan identifies potential problems (relevant and site-specific disease and health risks) and specific steps taken to mitigate these risks (e.g., immunizations, good animal husbandry, sanitation, nutrition and other relevant practices).</p> <p>b) Records are kept documenting health history of each animal.</p> <p>c) Records are kept of <u>casualty euthanasia</u> incidences and causes.</p> <p>d) Vaccinations include the ones required by animal health regulatory authorities.</p> <p>e) Animal diseases are monitored, controlled and treated by veterinarians or trained personnel.</p> <p>f) Where calves are raised, the plan includes means for reducing stress and pain associated with weaning and castration, and dehorning/disbudding if practiced.</p> <p>g) All medications are registered and:</p> <ol style="list-style-type: none"> <li>1) Are prescribed by veterinarians and approved by national animal health regulatory authorities;</li> <li>2) Administered strictly according to label instructions, including withdrawal periods and expiration dates;</li> <li>3) Dosage variations are permitted only when approved by veterinarians or authorized veterinary service providers;</li> <li>4) Are stored safely to minimize risk to human health and the environment and in compliance with label instructions.</li> </ol> <p>h) Sick or injured animals are treated, and isolated where appropriate. Cattle with an illness or infection for which antibiotic treatment is indicated must be treated.</p> <p>i) Dead animals are disposed of promptly to eliminate the risk of environmental contamination, the spread of disease, and the risk of attracting predators.</p>
<p><b>1.5</b> The operation regularly monitors and keeps up-to-date records of natural resource conditions, inputs, operations, and <u>product quality</u>. <i>Critical Criterion CC+3</i></p>	<p>a) For each principle and sub-principle, monitoring records document the effectiveness of current practices in meeting objectives and in addressing identified issues of concern / improvement opportunities;</p> <p>b) Monitoring records include a site-appropriate suite of complementary short-term (measured multiple times per year) to longer-term indicators (measured every 2+ years).</p> <p>c) Monitoring utilizes measures relevant to the site, and to the objectives, scope, and scale of the operation.</p> <ol style="list-style-type: none"> <li>1) Monitoring measures are appropriate indicators for evaluating progress toward achieving continuous improvement goals;</li> </ol> <p>d) Recordkeeping is sufficient to document compliance with the Grasslands Alliance standard, including triple bottom line outcomes as described in the operations plan.</p>
<p><b>1.6</b> Collected monitoring data are analyzed at least annually to</p>	<p>a) Data are analyzed relative to the targets and actions identified in management plans;</p>

<p>evaluate continuous improvement in the achievement of objectives, and to update objectives, targets, and management actions to improve operation performance in the next planning cycle.</p> <p><i>Critical Criterion CC+3</i></p>	<p>b) The operation must be able to demonstrate implementation of a complete adaptive management cycle, including specific examples of how it uses assessment and monitoring records and other available information to:</p> <ol style="list-style-type: none"> <li>1) Identify and address problems;</li> <li>2) Adjust management practices;</li> <li>3) Achieve objectives and 1 year, 3 year, and 5 year continuous improvement goals.</li> </ol>
<p><b>1.7</b> Technical assistance and continuing education provide BMPs and improved management systems that are implemented as part of an ongoing continuous improvement program.</p>	<p>a) The producer/manager can demonstrate having received technical assistance from an accredited technical assistance specialist from university extension, NRCS, or a private consultant on the development and/or implementation of the operation management plan, including by providing contact information for the providing organization, agency or company; or</p> <p>b) The producer/manager can document completion of continuing education courses related to the planning and management system requirements of this standard, <u>and</u> can demonstrate implementation of management systems and practices recommended in completed courses.</p>

## Principle 2: Wildlife Habitat and Biodiversity Conservation

*Beef production contributes to the maintenance or enhancement of native wildlife and plant biological diversity.*

“Adding wildlife income to a New Mexico ranch contributes 2.5 times more to ranchland market value than does a similar amount of livestock income.” – John Tanaka and colleagues<sup>5</sup>

**Objectives and outcomes of Principle 2:** This principle contributes to the protection of biological diversity, natural ecosystems, and their values on and around certified and continually improving operations. Ranches and farms protect natural ecosystems and do not contribute to overgrazing, deforestation, and other forms of habitat degradation and land conversion. Additionally, operations conserve or restore the diversity of native grass, shrub, and tree species and communities, thus providing wildlife habitats and ensuring the delivery of ecosystem services. Ranches and farms also contribute to conservation in the broader landscape by maintaining wildlife corridors, riparian habitats and aquatic ecosystems, by collaborating with neighbors, agencies and other organizations implementing regional conservation activities, and by avoiding negative impacts to surrounding natural ecosystems and protected areas. Operations support the protection of rare, threatened and endangered species and other native flora and fauna by sustainably managing natural ecosystems, by taking proactive steps to minimize conflicts with predators and other native wildlife, and by carefully implementing integrated pest management (IPM) activities to avoid unintended consequences for native wildlife and plants. Activities and policies of the operation comply with local/state/regional/federal regulations and management plans. Principle 2 recognizes the important role of well-managed ranches and farms in conserving America’s natural heritage of wildlife habitats and biodiversity<sup>6</sup>.

Good and continuously improving management of wildlife habitat and biodiversity can offer ranches and farms opportunities to diversify revenue streams, adding to those generated by beef and other cattle products<sup>7</sup>. For example, compliance with Principle 2 provides for fish and game species and watchable wildlife, which can be the foundation for economically viable tourism and outdoor recreation programs. In addition, it enables ranches and farms to minimize business risks by keeping ahead of environmental regulations and associated risks, and to build a reputation as a responsible business, boosting brand reputation and sales.

Within the scope of Principle 2 are issues and concepts about which there remains considerable uncertainty. In cases of uncertainty, the use of a *precautionary approach* is present both implicitly and explicitly in several aspects of the Principle because mitigation, repair and restoration are often difficult, more costly, and sometimes impossible<sup>8</sup>.

Criterion	Indicators
2.1 A Wildlife Habitat and Biodiversity Conservation Plan is developed as part of the Resource	a) The Wildlife Habitat and Biodiversity Conservation Plan includes: <sup>9</sup> 1) <u>Conservation targets</u> : Identifies the regionally <u>important species</u> and vegetation types that occur in the planning area, including:

<p>Management Plan. The Wildlife Habitat and <u>Biodiversity Conservation Plan</u> identifies and maps natural ecosystems, and conserves <u>rare, threatened, and endangered species and communities (RTESC)</u>, <u>vegetation cover types</u>, and <u>important wildlife species (IWS)</u> on all owned and leased lands utilized for beef production.</p> <p><b>Critical Criterion CC+3</b></p>	<p>(1) known occurrences of RTESC and <u>important native plant and wildlife species</u> and their habitats; and (2) occurrences of local and regional priority invasive species within the operation, as well as potential threats in the surrounding area;</p> <ol style="list-style-type: none"> <li>2) <u>Current status of targets</u>: Describes the current condition or status of the conservation target(s);</li> <li>3) <u>Goals for each target</u>: Establishes operation-specific goals to achieve for the plants, animals and vegetation types identified as targets (e.g., maintain and protect or increase and restore);</li> <li>4) <u>Threats/hurdles</u>: Identifies the conditions or issues of concern that need to be addressed to achieve goals. Reviews the potential impacts of current operation management practices on <u>RTESC</u>, <u>IWS</u> and invasive species at the appropriate pasture, ranch, or landscape level;</li> <li>5) <u>Strategies to achieve goals</u>: Using the findings above, develops the most appropriate or feasible strategies, BMPs or activities that can be implemented to address identified issues of concern;</li> <li>6) <u>Monitoring</u>: Develops a monitoring strategy to regularly evaluate the effectiveness of strategies, practices and activities for achieving goals of having successfully conserved or restored the identified target(s);</li> <li>7) <u>Evaluate and adjust</u>: Describes how the producer/manager uses monitoring records to determine management decisions.</li> </ol>
<p><b>2.2</b> Grazing and ranch management practices maintain, enhance, and/or restore <u>natural ecosystems and ecosystem processes</u>. <u>Rangelands and pastures</u> are managed to achieve desired wildlife habitat and structural conditions and to prevent <u>degradation</u>.</p> <p><b>Critical Criterion CC+3</b></p>	<ol style="list-style-type: none"> <li>a) <u>Natural ecosystems</u> are conserved through strict <u>preservation, restoration</u>, or sustainable management.</li> <li>b) <u>Natural disturbance regimes</u> important to <u>productivity</u> and local biodiversity are maintained and restored, and are allowed to operate in natural areas.</li> <li>c) Management activities (e.g., the timing, intensity and duration of grazing; timing of hay harvesting; hunting and fishing management) minimize negative impacts to natural ecosystems and ecosystem processes, and provide structural habitat that supports the biodiversity goals described in the Conservation Plan.</li> </ol>
<p><b>2.3</b> Grazing and ranch management practices maintain and/or enhance important native wildlife species and their habitats.</p>	<ol style="list-style-type: none"> <li>a) Grazing and other resource management practices minimize impacts on <u>important wildlife species (IWS)</u> identified in the conservation plan, especially during critical reproduction and migratory periods (e.g., nesting, calving, fawning, and brood-rearing seasons).</li> <li>b) Wildlife-friendly infrastructure is installed to achieve management goals for species identified as targets in the conservation plan. <ol style="list-style-type: none"> <li>1) If stock ponds include wildlife or natural habitat, those resources are managed to maintain or enhance habitat.</li> </ol> </li> <li>c) Implementation of a <u>forage-animal balance</u> ensures that forage produced or available meets forage demands of both livestock and native wildlife.</li> </ol>

	<p>d) Non-predatory wildlife is allowed to co-exist with livestock except where shared diseases are a concern documented by <u>scientific consensus</u>.</p> <ol style="list-style-type: none"> <li>1) Where management is required to protect crops or livestock from wildlife damage or disease, non-lethal practices are proactively used.</li> <li>2) Where <u>lethal control</u> of species is necessary, it is used only as a measure of last resort and in compliance with local, state and federal regulations.</li> </ol> <p>e) Species identified as targets in the conservation plan, including keystone species, are not harmed.</p> <p>f) Aquatic ecosystems and species on the operation are protected from contamination by farm operations, and fish passage is maintained or enhanced.</p>
<p><b>2.4</b> Grazing and ranch management practices conserve <u>rare, threatened and endangered species/communities (RTESC)</u> and their habitats. <i>Critical Criterion CC+3</i></p>	<p>a) The operation can document:</p> <ol style="list-style-type: none"> <li>1) Protection of RTESC that are state or federally listed under an endangered species law or identified under a state wildlife action plan (SWAP). Conservation actions to maintain, restore or enhance the extent, quality and viability of the identified species and their habitats are documented in the Conservation Plan.</li> <li>2) <u>Natural ecosystems</u> are managed to benefit the specific needs of threatened or endangered species that occur locally.</li> <li>3) Grazing schedules and stocking rates are designed to meet the habitat requirements of RTESC identified as targets.</li> <li>4) Monitoring data verifies that RTESC and other High Conservation Value targets identified in the Conservation Plan are trending toward goals established in the conservation plan.</li> <li>5) Cooperation with RTESC inventories and surveys. The landowner has the discretion to keep the specific location(s) of RTESC occurrence(s) confidential.</li> </ol>
<p><b>2.5</b> <u>Non-lethal strategies</u> are used for managing, controlling and coexisting with <u>predators</u>.</p> <ul style="list-style-type: none"> <li>• Killing of individual predators that have killed livestock is rare, and occurs only after co-existence and non-lethal approaches have failed, and predator damage has been established by trained professionals.</li> <li>• Where <u>lethal control</u> of predator species is necessary, it is executed in compliance with local, state and federal</li> </ul>	<p>a) The operation uses non-lethal coexistence practices to protect livestock from predators.</p> <p>b) The operation recognizes the importance of native predators to the local ecosystem.</p> <p>c) If livestock are lost due to <u>predator</u> species, then:</p> <ol style="list-style-type: none"> <li>1) Management of <u>predator</u> species is addressed in the operation’s resource management plan;</li> <li>2) <u>Workers</u> are trained in procedures and emergency responses for addressing predator attacks or livestock losses to predators;</li> <li>3) Under no circumstance are toxic substances (including toxic baiting of carcasses) used for controlling predators.</li> </ol>

<p>regulations and the animal is euthanized as quickly and painlessly as possible.</p> <p><i>Critical Criterion CC+3</i></p>	
<p><b>2.6</b> Grazing and ranch management maintains and/or improves <u>habitat connectivity</u>, natural <u>habitat diversity and heterogeneity</u> at the ranch and/or <u>landscape scale</u>.</p>	<p>a) Infrastructure, fencing, and wildlife corridors are designed and sited to minimize human-wildlife conflict, and allow wildlife species to migrate between habitats with minimal restriction or hazard of injury.</p> <p>b) The operation has made on-farm habitat improvements on their own, or involved with other landowners, conservation organizations or state/federal agencies to link individual on-farm actions/activities to larger landscape activities.</p> <p>c) The operation can document improvements to habitat connectivity.</p> <p>d) Observed natural habitat diversity and heterogeneity includes successional stages and plant community types required to support goals identified in the conservation plan.</p>
<p><b>2.7</b> Natural ecosystems and <u>high conservation value areas</u> are protected from <u>land conversion</u> and <u>degradation</u>.</p> <ul style="list-style-type: none"> <li>• All <u>natural ecosystems</u> and <u>High Conservation Value areas</u> present on the operation are identified and <u>conserved</u>.</li> <li>• In the five-year period prior to the date of initial application for Grasslands Alliance certification, there has been no <u>destruction of natural ecosystems</u> or <u>High Conservation Value (HCV) areas</u>.</li> </ul> <p><i>Critical Criterion</i></p>	<p>a) The operation can document that no <u>conversion</u> or <u>degradation</u> of identified <u>natural ecosystems</u> or <u>High Conservation Value areas</u> has occurred in the five-year period prior to the date of initial application for Grasslands Alliance certification.</p> <p>1) Exceptions will be considered for operations that have changed management or ownership on a case-by-case basis. Specific documentation requirements can be found in the Policies and Procedures Manual.</p> <p>b) The producer/manager can document research to identify high conservation value areas present on the operation, and results of that research;</p> <p>c) The producer/manager can document steps to conserve natural ecosystems and high conservation value areas present on the operation. Please refer to the Guidance Manual for options accepted by GA.</p>
<p><b>2.8</b> <u>Riparian zone</u> structure and function is maintained or progressively <u>restored</u> around all naturally occurring flowing and still <u>water bodies</u> and other wetlands to conserve <u>terrestrial</u> and aquatic biodiversity.</p> <ul style="list-style-type: none"> <li>• <u>Riparian buffers</u> exist and are maintained. Buffer size and composition is appropriate to site and environmental conditions necessary to achieve</li> </ul>	<p>a) The written grazing plan specifically considers riparian areas and wetlands and their enhancement or maintenance in <u>good</u> or improving condition as documented by assessment or monitoring data.</p> <p>1) The grazing schedule is designed to minimize degradation of riparian areas and wetlands.</p> <p>2) Off-stream water and/or other management practices help to minimize degradation of riparian zone and wetland vegetation.</p> <p>b) Riparian habitats are in good condition as documented by a passing score on a Proper Functioning Condition (PFC) assessment or equivalent rapid stream assessment.</p> <p>c) Riparian buffers are maintained and functional.</p>

<p>goals established in the conservation plan.</p> <p><b>Critical Criterion CC+3</b></p>	<ol style="list-style-type: none"> <li>1) Buffer width is appropriate to site and environmental conditions and is adequate to minimize overland flow.</li> <li>2) If fencing is used to keep livestock out of the riparian area, fencing is adequately maintained.</li> <li>3) Where there is direct livestock access to stream watering sites, access is controlled/limited so that little or no damage is done to riparian areas. Stream bank and channel morphology and water quality for livestock, fish and wildlife are maintained or enhanced.</li> <li>d) Where due to degradation, the required riparian zones do not exist or exist only partially, a six-year plan for their full establishment to meet site potential is defined and implemented on schedule.</li> </ol>
<p><b>2.9</b> IPM activities prevent, control and manage invasive species while avoiding and minimizing impacts to native wildlife and plants.</p> <ul style="list-style-type: none"> <li>• Management activities avoid causing or increasing the introduction and spread of invasive species identified as threats to local biodiversity.</li> </ul>	<ol style="list-style-type: none"> <li>a) Steps taken to eradicate invasive species in natural areas do not harm the habitat and populations of native plant and wildlife species.</li> <li>b) Monitoring records document the effectiveness of invasive species management at avoiding their impacts to biodiversity.</li> <li>c) Invasive species or their parts are not disposed in riparian zones or waterways, and riparian zones are kept free from invasive species.</li> </ol>

## Principle 3: Natural Resource Conservation

**Objectives and outcomes of Principle 3:** This principle helps to ensure that beef operations conserve the natural resources that are the basis of sustainable cattle ranching and farming, optimize efficiencies of natural resource and input use, and minimize environmental pollution. Resource-specific objectives and outcomes are described for each sub-principle below.

### Sub-Principle 3.1 – Productivity and Management of Rangeland Vegetation, Pasture Forage, and Feed Crops

*Grazing, forage improvement, and feed crop management practices maintain or enhance the productivity and resilience of native rangeland and pasture forage plant species.*

“Well-managed pasture systems combine vigorous perennial vegetation cover, reduced pesticide and fertilizer inputs, and lower costs of production using ecological approaches to generate ecosystem services for society, as well as economic sustainability for the producer.” –Alan Franzluebbers and Colleagues<sup>10</sup>

**Objectives and outcomes of Sub-Principle 3.1:** Ranches and farms that meet this principle are implementing grazing management and forage enhancement practices that maintain or improve rangeland health, pasture condition, and (where applicable) feed crop productivity, resulting in healthy, deep-rooted plants. Both grazing and vegetation management practices (e.g., forage enhancements that utilize tools such as prescribed fire, brush removal, and/or IPM applications) are carefully planned to avoid unintended consequences, maintain or improve ecological integrity, and cut input costs. Efforts to prevent and control invasive plants maintain rangeland health, pasture condition, and feed crop productivity, and minimize the need for herbicides, which are not only economically costly, but can pose risks to the health of ranching families, workers, communities, and ecosystems<sup>11</sup>. Feed crops are produced in a manner that reflects Grasslands Alliance principles, using sustainability as a lens to identify opportunities to improve efficiencies of input application and reduce risks associated with nutrient and pesticide pollution. Together, the result of these outcomes is an operation that supports locally appropriate levels of plant cover and diversity and in turn water infiltration, which can help to raise the water table, further benefiting forage productivity. Another benefit is to increase the resilience of the operation to drought and other forms of extreme weather-related events<sup>12</sup>. Thus, meeting this sub-principle can help producers extend the growing season, reduce supplemental feed costs, improve livestock weight gain and sales prices, and mitigate risks to forage and feed supplies.

Criterion	Indicators
<p><b>3.1.1</b> A Grazing and Pasture Management Plan is developed and implemented as part of the resource management plan. The Grazing and Pasture Management Plan optimizes forage and cattle</p>	<p>1. For the Grazing and Pasture Management Plan:            a) The Grazing and Pasture Management Plan addresses management actions, including corrective actions and land-based action plans, for each <u>production area</u> (including all owned and leased lands) proposed for continuous improvement and/or certification. The plan includes a</p>

<p>productivity while promoting ecological goals through <u>adaptive</u> resource management.</p> <ul style="list-style-type: none"> <li>The resilience of rangeland vegetation and pasture forage to drought, extreme weather, and other unexpected events is <u>maintained</u> or <u>enhanced</u>.</li> </ul> <p><u>Critical Criterion CC+3</u></p>	<p>timeline for implementation and monitoring to ensure management objectives are accomplished.</p> <p>b) The Grazing and Pasture Management Plan is based on an ecological assessment and includes goals addressing economic opportunities, natural resources health, wildlife habitat and biodiversity, and livestock health and welfare. It includes:</p> <ol style="list-style-type: none"> <li>1) A forage inventory of the expected forage quality, quantity and species in each management unit;</li> <li>2) A <u>forage-animal balance</u> that ensures forage produced or available meets the nutritional demands of livestock and/or wildlife;</li> <li>3) A calculation of carrying capacity and stocking rates for each production area, and use of result to evaluate of how periods of grazing, deferment, rest and other treatments balance with the land’s ecological potential and the climate year. Stocking rates and grazing periods are adjusted according to this evaluation;</li> <li>4) A monitoring plan for pasture and herd health; and</li> <li>5) A <u>contingency plan</u> for preventing long-term damage and maximizing resilience / potential for post-drought recovery.</li> <li>6) As part of the Grazing and Pasture Management Plan, a written long-term Vegetation Management Plan documents rangeland and pasture histories, assesses the identity and condition of desirable major forage species and undesirable (e.g., invasive, toxic, unpalatable) plant species, and addresses identified issues of concern to vegetation and/or forage productivity.</li> </ol> <p>c) <u>Introduced Forage</u> species are selected considering agro-ecological conditions, production rates, nutritional value, non-invasiveness, and resistance to pests or adverse climatic conditions;</p> <p>d) Forage quantity, quality and growth conditions are evaluated periodically to optimize pasture recovery periods for forage growth, dormant season forage supply, and drought reserve.</p> <p>e) Grazing and other operation management practices maximize resilience by maintaining healthy, deep-rooted, diverse vegetation and forage bases.</p>
<p><b>3.1.2</b> Grazing management maintains or improves the productivity, diversity, and reproductive capability of key native and forage species.</p>	<p>a) Stocking rates are established and implemented that maintain or improve productivity of rangeland vegetation and/or pasture forage, and address identified issues of concern.</p> <p>b) Stocking rates are based on the forage inventory and animal demand balance (i.e., <u>forage-animal balance</u>). Methods to calculate stocking rates consider utilization levels, harvesting efficiencies, and adjustment factors such as distance from water and slope.</p> <p>c) Monitoring records demonstrate that results are within acceptable parameters for the rangeland vegetation and/or pasture forage crop(s) produced, considering external factors such as recent growing conditions.</p> <p>d) If the productivity, diversity, and/or reproductive capability of plants are below parameters expected according to the <u>Ecological Site</u></p>

	<p><u>Description (ESD), Forage Suitability Group Description, or equivalent benchmark, the operation must develop and implement corrective actions.</u></p>
<p><b>3.1.3</b> Grazing, pasture, IPM, and other operation management practices prevent, control and minimize the extent of invasive and other undesirable plant species.</p> <ul style="list-style-type: none"> <li>• Invasive plant species are not intentionally introduced and already present invasive plant species are progressively reduced or controlled.</li> <li>• The introduction or production of forage crops that are invasive in the target region and that may disrupt biodiversity on an <u>eco-regional scale</u> is prohibited.</li> </ul> <p><b>Critical Criterion CC+3</b></p>	<p>Where invasive plant species are present or have been identified in the surrounding area:</p> <ol style="list-style-type: none"> <li>Areas on the operation infested with (and/or vulnerable to infestation by) invasive plant species are regularly monitored and weed populations are tracked over time.</li> <li>Where noxious weeds listed by federal, state, or local invasive assessment programs<sup>13</sup> are present, the <u>extent of infestations</u> is documented and management practices are developed and implemented that minimize the risk of spread, eradicate early-stage infestations, and control and manage identified infestations.</li> <li>Prescribed grazing and/or other locally appropriate conservation practices are developed and implemented that prevent, control and minimize the extent of invasive and other <u>undesirable</u> plant species.</li> <li>Invasive plant species, including noxious and nuisance weeds, are controlled using IPM, including by limiting invasions from off-site.</li> <li>Locally produced or imported hay and/or forage is weed-free.</li> <li>Selection of introduced forage species and cultivars considers invasiveness and does not utilize those that pose a risk to native species or ecosystem processes.</li> <li>The producer/manager monitors the effectiveness of management in preventing or controlling invasive plant species.</li> <li>Records indicate that invasive plant management extends beyond the ranch property, and considers community and regional strategies.</li> <li>A technical assistance specialist has helped identify locally appropriate practices to prevent, control and manage priority invasive plant species.</li> </ol>
<p><b>3.1.4</b> Forage species and cultivars are selected considering <u>agro-ecological conditions</u>, production rates, nutritional value, and resistance to pests or adverse climatic conditions.</p>	<p><b>1. Rangelands</b></p> <ol style="list-style-type: none"> <li>Native species suited to the site are selected for planting and replanting whenever available and ecological conditions will support their growth.</li> <li>Where ecological conditions do not allow for successful seeding of native plant species, non-native forage species that (1) are not invasive and (2) otherwise do not pose threats to biodiversity may be used.</li> <li>A local source of known provenance is used when available and when the local source is equivalent in terms of quality, price and productivity to maintain local genetic diversity and ecosystem function and to protect native biodiversity.</li> <li>The use of non-local sources may be justified in situations such as where other management objectives (e.g., fire resistance or adapting to climate change) are best served by non-local sources or where availability of locally adapted plant materials is limited.</li> </ol>

	<p><b>2. Improved pasture</b></p> <p>a) Legumes are a key functional group, and a target of 20 to 30% of forage yield (on an annual basis) is ideal<sup>14</sup>.</p> <p>b) When reseeding, seedbed preparation practices are selected that maintain or enhance soil health.</p>
<p><b>3.1.5</b> Operations that produce on-farm <u>feed crops</u> for storage utilize agronomic practices that take into account agro-ecological conditions, production rates, nutritional value, and resistance to pests or adverse climatic conditions.</p>	<p>a) Producer/manager can document that feed was produced using a production system or verification program aligned with Grasslands Alliance principles, or that otherwise effectively addresses feed production impacts and demonstrates a commitment to continuous improvement.</p>
<p><b>3.1.6</b> Where stored feed is brought in from off-farm, it is produced in accordance with Grasslands Alliance standards or those of a sustainable production program accepted by Grasslands Alliance.</p>	<p>a) If stored feed is brought in from off-farm, feed is produced in accordance with Grasslands Alliance criteria for feed crop and hay production (Principles 3-4 and Criteria 1.4, 1.6-1.7, 2.7, 2.9, 6.1, 6.5-6.9) or documentation of compliance/verification/certification of a sustainable production program accepted by Grasslands Alliance. For options of qualifying programs, see the Guidance manual.</p>
<p><b>3.1.7</b> <u>Forage enhancements</u> maintain ecological integrity and native habitat, and reduce and minimize net <u>greenhouse gas</u> emissions.</p> <p><i>Critical Criterion CC+3</i></p>	<p>b) The use of fire for pasture management is permitted as part of a planned process to enhance forage and avoid negative impacts to native species, and where fire is the option of less environmental impact in comparison with other pest, weed, and invasive plant control measures.</p> <p>c) To avoid and minimize unintended consequences in light of identified regional, local, and on-ranch resource concerns, all operations conducting forage improvement treatments such as brush removal, prescribed fire, and aerial herbicide applications either:</p> <ol style="list-style-type: none"> <li>1) can document that a technical assistance specialist has advised the planning and execution of treatments , or</li> <li>2) follow the recommendations of extension, NRCS or equivalent management resources in planning and executing treatments.</li> </ol>
<p><b>3.1.8</b> <u>Intensive use areas</u> near ranch facilities including corrals and sorting, feeding and calving pens/pastures are actively managed to prevent resources <u>degradation</u> and monitored for impacts on adjacent uplands and riparian areas.</p>	

## Sub-Principle 3.2 – Soil Conservation and Soil Health

*Beef production maintains or improves soil health by minimizing erosion and compaction, maintaining or enhancing soil fertility at appropriate levels, and promoting healthy biological systems and chemical and physical properties.*

“Our soil teems with a multitude of organisms, which provide the necessary work for healthy plants to grow free from disease, pests, and infertility. These interconnected interactions and feeding relationships (quite literally, “who eats who”) help determine the types of nutrients present in the soil, its depth and pH, and even the types of plants which can grow.” – SoilFoodWeb.com

“Positive relationships have been observed between SOC (soil organic carbon) and plant productivity, water infiltration, and soil biodiversity. Increasing SOC can also limit soil loss, water and nutrient runoff and net greenhouse gas emissions.” – Alan Franzluebbers and colleagues<sup>15</sup>

“If soil is depleted or degraded, the amount of energy flowing into the ecosystem will diminish.” – H.H. Janzen<sup>16</sup>

**Objectives and outcomes of Sub-Principle 3.2:** Good stewardship of soil health is the foundation of well-managed cattle ranching and farming. This principle recognizes operations that manage grazing lands in a way that maintains and improves soil health, minimizes soil erosion and compaction, and maintains soil fertility at locally appropriate levels. The outcome of meeting this sub-principle is an operation with a grazing regime appropriate to local soil conditions and that strategically places water sources and attractants to optimize livestock distribution, minimizing erosion and compaction, evenly distributing deposited nutrients, and maintaining a level of forage productivity that meets or exceeds site potential. Since soils that absorb more rainfall slow runoff, the operation reduces erosion and sediment pollution of waterways and associated risks. Ranches and farms that utilize improved pasture and/or cropland apply nutrients at appropriate agronomic rates, which not only optimizes soil health, but also helps cut fertilizer costs and pollution-related risks. Together, these strategies for maintaining appropriate levels of soil fertility, soil stability, and water infiltration benefit forage health, and thus livestock weight gain and sale prices.

Criterion	Indicators
<p><b>3.2.1</b> A <u>Soil Health</u> Plan is developed and implemented as part of the Resource Management Plan. The Soil Health Plan maintains and improves soil quality, includes soil conservation goals, and addresses soil fertility.</p>	<ul style="list-style-type: none"> <li>a) The Soil Health Plan identifies issues of concern and selects locally appropriate corrective actions to improve soil health.</li> <li>b) Locally appropriate BMPs are in place to maintain and restore soil health, including steps to optimize soil productivity/fertility, reduce and minimize soil erosion and compaction, and minimize adverse impacts of soil surface disturbances and input applications to soil biota.</li> <li>c) Soil monitoring records verify achievement of soil health objectives.</li> <li>d) Advanced soil quality indicators related to nutrient retention and uptake, infiltration, and water holding capacity (e.g., organic matter</li> </ul>

	content, soil aggregation) are monitored and improvements documented.
<p><b>3.2.2</b> Soil fertility is maintained at or restored to locally appropriate levels through well-managed grazing.</p> <ul style="list-style-type: none"> <li>On <u>improved pasture</u> or cropland, nutrients are managed to protect soil fertility and biota through precise selection and application of <u>organic and mineral fertilizers</u>.</li> </ul>	<ul style="list-style-type: none"> <li>a) Assessment results and/or monitoring records indicate locally appropriate levels of soil fertility.</li> <li>b) % cover by bare ground, % litter, and soil organic matter are at <u>locally appropriate</u> levels;</li> <li>c) Plant growth is <u>vigorous</u>; forage productivity reflects the potential for the site and climate year.</li> <li>d) Plant community composition is appropriate in relation <u>to potential</u>.</li> <li>e) Dung distribution (evenness across a pasture) and breakdown rates are managed with herd movements and mechanical means where appropriate, and indicate healthy nutrient cycles.</li> </ul>
<p><b>3.2.3.</b> Grazing and other operation management practices avoid or minimize erosion, and enhance soil health.</p> <ul style="list-style-type: none"> <li>If a mixed crop system is used, soil preparation and crop production avoids or minimizes negative impacts of soils, including erosion.</li> </ul> <p><i>Critical Criterion CC+3</i></p>	<p><b>1. All Operations:</b></p> <ul style="list-style-type: none"> <li>a) Assessment results and/or monitoring records indicate locally appropriate levels of soil erosion and/or stability.</li> <li>b) The % cover by bare ground, plant cover and litter in pasture areas are at <u>locally appropriate</u> levels.</li> <li>c) Erosion control objectives are met, including protection of soil and water quality.</li> <li>d) Operations management prevents and minimizes erosion caused by soil preparation, forage production, high use areas (e.g., corrals, backgrounding lots), road construction and maintenance, oil and gas extraction, off road vehicle (ORV) use, and other management activities that mechanically disturb soils.</li> <li>e) The operation map identifies areas of the operation vulnerable to wind and water erosion, and appropriate management techniques reduce erosion and maintain or improve soil stability in these areas.</li> <li>f) Grazing management protects sites sensitive to erosion as conditions warrant: e.g., seasonal or permanent exclusion of animals from steep slopes (&gt;30%), highly erodible soils, riparian habitats (stream banks), and other sensitive soils to prevent and minimize erosion.</li> </ul> <p><b>2. Additionally, for rangeland:</b></p> <ul style="list-style-type: none"> <li>a) Where biological soil crusts naturally occur, they are intact or otherwise in good condition <u>relative to potential</u> for the site.</li> </ul> <p><b>3. Additionally, for improved pasture and/or cropland:</b></p> <ul style="list-style-type: none"> <li>a) Where operations utilize tillage, it is implemented judiciously as a tool. Examples include: <ul style="list-style-type: none"> <li>1) The tillage system conserves soil (lessens soil erosion) and/or improves soil health;</li> <li>2) Non-inversion tillage methods result in crop residue left on the soil surface during critical erosion periods (e.g. conservation tillage);</li> <li>3) The producer/manager conducts periodic monitoring to verify that any tillage systems minimize erosion and runoff.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>b) Cover crops/ground cover are planted and maintained in production areas where this does not compete with crops for water or nutrients. <ul style="list-style-type: none"> <li>1) Cover crops are planted to improve drainage and increase the tilth of the soil;</li> <li>2) All areas with existing ground cover and areas planned for planting ground cover are indicated on maps.</li> </ul> </li> <li>c) The operation obtains a score less than or equal to T, or equivalent, for the current Revised Universal Soil Loss Equations.</li> <li>d) Traffic on the operation is effectively controlled to avoid and minimize erosion (e.g. use of field borders, tractor paths and lanes within fields for machinery).</li> </ul>
<p><b>3.2.4.</b> Land management practices including grazing and pasture management, soil preparation, and on-farm crop production practices avoid or minimize soil compaction and related impacts on soils, and enhance soil health.</p> <ul style="list-style-type: none"> <li>• Where soil compaction has been identified as an issue of concern, corrective actions are implemented to reduce its impacts.</li> </ul>	<ul style="list-style-type: none"> <li>a) The grazing management system prevents and minimizes soil compaction due to livestock production.</li> <li>b) Soil compaction is periodically assessed and does not negatively impact soil health. Monitoring records show locally appropriate or decreasing levels of soil compaction.</li> <li>c) Pastures contain few or no areas of impervious surfaces; evidence of compacted soils is minimal and limited to intensive management areas.</li> <li>d) The producer/manager provides recent <u>Rangeland Health Assessment</u> or <u>Pasture Condition Scoring</u> results or equivalent monitoring records that document <u>locally appropriate</u> levels of soil compaction.</li> <li>e) Stocking rates and timing of grazing are designed to prevent and minimize soil compaction.</li> <li>f) Pastures containing clay soils are managed to minimize <u>pugging</u> and compaction.</li> <li>g) Heavy equipment is not used when soils are wet or saturated.</li> <li>h) Where tillage is used, tillage practices conserve soil, lessen soil compaction and/or improve soil health.</li> </ul>

### **SUB-PRINCIPLE 3.3 – Water Conservation & Water Quality**

*Beef production practices efficiently use and do not deplete the quantity of surface or ground water, and maintain or improve surface and groundwater quality.*

“With use of off-stream water and salt to improve livestock distribution and reduce negative impacts to riparian habitats and water quality, cattle were distributed more evenly, consumed more upland forage before maximum riparian utilization was reached, gained more weight, and resulted in a positive return on investment (ROI).” – Stillings and Colleagues<sup>17</sup>

“Rural areas of the U.S., as well as the general public, depend on water yields for their water supply. One of the factors determining the yield in these areas is the condition of the grazing lands where precipitation falls. Lands with sufficient vegetative cover reduce erosion and the possibility of flooding by slowing and more evenly distributing surface waters while promoting percolation of precipitation to recharge groundwater aquifers.” – Grazing Lands Conservation Initiative<sup>18</sup>

**Objectives and outcomes of Sub-Principle 3.3:** The Water Conservation section of this sub-principle addresses both efficiency of water use and prevention of fresh water depletion. Compliance demonstrates that ranches and farms manage water consumption to ensure that water is efficiently delivered to the animals and crops, and to prevent depletion of fresh water ecosystems and aquifers by using the minimum quantity of water necessary for production. The operation uses efficient practices (e.g., timing of water applications) and equipment technologies that optimize the quantity and duration of fresh water from various sources available for livestock and other animal species, as well as for locally important aquatic ecosystem values<sup>19</sup>. Optimizing water use efficiency generates cost savings on both irrigation water and energy use for irrigation pumping, and is likely to provide benefits to water quality, vegetation health, and biodiversity where it reduces withdrawals from streams and raises the water table. In addition, meeting this sub-principle increases the resilience of the operation to drought.

The Water Quality section of this sub-principle verifies that beef operations minimize water pollution through well-managed grazing, IPM (that avoids pesticide runoff), and precise nutrient and manure management that prevents runoff into surface and ground waters. There is no evidence of contamination of on-ranch water resources by pollutants such as sediment, nutrients and pathogens from manure (either in or next to water bodies), pesticides, fertilizer, garbage, and oil from vehicles and equipment. As a result, water leaving the ranch and entering public waterways is clean, maintaining the health of aquatic ecosystems and minimizing the health, business, and environmental risks posed by nutrient, pathogen, pesticide, sediment, and other forms of water pollution. In addition, by helping to minimize risks of pathogens reaching waterways, this sub-principle provides valuable health safeguards to workers and communities, and helps operations keep ahead of regulations pertaining to water pollution.

Criterion	Indicators
3.3.1 Water consumption is monitored and analyzed.	a) Current and future water consumption is calculated for irrigated pastures, crop production, and processing operations in order to

<p>Systems are implemented to reduce or optimize water use, increase or optimize water use efficiency, and prevent <u>fresh water depletion</u>.</p> <ul style="list-style-type: none"> <li>• <u>Rights to water use</u> can be documented, e.g. irrigation district membership, etc.</li> </ul> <p><i>Critical Criterion CC+3</i></p>	<p>detect areas of excessive consumption and opportunities for conservation.</p> <ul style="list-style-type: none"> <li>b) Monitoring records confirm water consumption is reduced to local potential given climate conditions.</li> <li>c) Water distribution systems conserve water, and foster the efficient use and replenishment of existing water sources.</li> <li>d) Water distribution and irrigation systems are maintained to prevent water losses.</li> <li>e) Livestock access to natural water sources is managed to avoid contamination of natural <u>water bodies</u>.</li> <li>f) Water applications to pastures containing freshly deposited manure are timed to avoid contaminating water bodies with pathogens.</li> <li>g) Efficient technologies and practices (e.g. timing and scheduling of irrigation) minimize water loss or overuse.</li> <li>h) Irrigation systems are designed, operated and calibrated to optimize forage and/or crop productivity while avoiding excessive water application, erosion, salinization, or fresh water depletion.</li> <li>i) Irrigation withdrawals do not deplete surface water levels in natural water bodies to an extent that impairs aquatic ecosystems and/or biodiversity.</li> <li>j) Irrigation diversions are properly screened and otherwise maintained to minimize impacts to aquatic species.</li> </ul>
<p><b>3.3.2</b> Ranch activities do not contribute to water pollution.</p> <p><i>Critical Criterion</i></p>	<ul style="list-style-type: none"> <li>a) Runoff from operation activities does not carry sediment, nutrient runoff, agrochemicals, pathogens or other pollutants into surface <u>water bodies</u>, including rivers, streams, lakes, wetlands, ponds and irrigation ditches.</li> <li>b) Runoff from operation activities does not carry nutrient runoff, agrochemical or other pollutants into ground water systems.</li> <li>c) Where water quality is an issue of concern, the Operations Plan (see 1.3) includes corrective actions.</li> <li>d) Waste water from processing or other on-site operations used for irrigation: <ul style="list-style-type: none"> <li>1) meets relevant water quality standards, including nitrogen, nitrate, phosphorus, total suspended solids and pathogens;</li> <li>2) nutrient load of waste water is factored into nutrient management;</li> <li>3) Waste water from industrial sources is prohibited.</li> </ul> </li> </ul>

## SUB-PRINCIPLE 3.4 – Integrated Pest Management (IPM) and Invasive Species

*Beef operations use an IPM approach to prevent, control and manage introductions of invasive plants and outbreaks of pests while minimizing impacts to human health and the environment.*

**Objectives and outcomes of Sub-Principle 3.4:** This sub-principle focuses on the effective control of invasive weeds, pests affecting animals, and, where applicable, crop pests. Compliance documents that the operation uses an IPM approach to prevent, control and manage introductions of invasive plants and outbreaks of pests while minimizing impacts to human health and the environment. The Grasslands Alliance requires an IPM approach that emphasizes the full range of pest tactics: prevention, avoidance, monitoring and, where necessary, suppression. Suppression tactics involve an appropriate balance of biological, mechanical and chemical control agents to minimize damage to native rangeland and pasture forage vegetation, wildlife, and ecosystem processes while controlling weeds and other pests. Pesticides are only used when shown to be necessary. Specific threats to human health and our environment associated with pesticide use are minimized through the implementation of required risk management practices.

Since invasive species may cause substantial degradation to rangelands and pastures, preventing and controlling their spread is critical for maintaining vegetation health, and for minimizing the use of herbicides, which are not only economically costly, but can pose risks to the health of ranching families, workers, communities and ecosystems<sup>20</sup>. Pests affecting livestock can negatively impact animal health, reduce livestock productivity, and in some cases impact food safety. Such pests must be managed using appropriate IPM tactics to ensure animal health and wellbeing.

Criterion	<i>Indicators and required risk management practices</i>
<p><b>3.4.1</b> The operation implements the IPM plan. <i>Critical Criterion CC+3</i></p>	<p>a) Activities identified in the IPM plan are executed. b) Monitoring data and recordkeeping demonstrate implementation.</p>
<p><b>3.4.2</b> Only pesticides that are legally registered in the U.S. for the animal/crop and pest combination are used. <i>Critical Criterion</i></p>	
<p><b>3.4.3</b> The use of GA prohibited pesticides listed in Annex 1 of this standard is prohibited.  The five nematicides cadusafos, ethoprop, fenamiphos, oxamyl and terbufos may only be used</p>	<p>a) GA nematicide risk management requirements are: 1) Use is part of the IPM plan and justified by the pest-specific thresholds defined for pest monitoring; and 2) Lower toxicity nematicides are used as part of the nematicides resistance management rotation; and 3) Application methods place the product precisely within the plant root zone or use tree injection; and 4) Re-entry intervals are enforced; and</p>

<p>under GA nematicide risk management requirements listed in Annex 3.</p> <p>The nine rodenticides brodifacoum, bromadiolone, bromethalin, chlorophacinone, difethialone, diphacinone, strychnine, warfarin and zinc phosphide may only be used under GA rodenticide risk management requirements.</p> <p><i>Critical Criterion</i></p>	<ol style="list-style-type: none"> <li>5) Daily maximum application time is limited to 4h per pesticide applicator; and</li> <li>6) Personal protective equipment (PPE) provides the strictest level of protection; and</li> <li>7) Medical monitoring of applicator health is provided (<i>criterion 4.24</i>).</li> </ol> <p>b) GA rodenticide risk management requirements are:</p> <ol style="list-style-type: none"> <li>1) Only formulated rodenticides baited traps classified as moderately toxic (blue label) or slightly toxic (green label) are used;</li> <li>2) Baited traps with rodenticides are only used, if rodent monitoring proves that mechanical traps for indoor control do not reduce the rodent population;</li> <li>3) Signs of rodent activity (droppings, tracks, gnaw marks, burrows, etc.) are monitored and premises and traps are inspected weekly;</li> <li>4) Bait stations with rodenticide are only used outside buildings, but not in open spaces or crop production plots, and no more than 30 meters from food packing facilities;</li> <li>5) Bait stations are tamper-resistant, anchored, and constructed in such a manner and size as to only permit the entrance of rodents;</li> <li>6) Food sources attracting rodents and debris is eliminated;</li> <li>7) Rodent carcasses are handled with gloves and buried in locations that do not pose risk to human health or water contamination;</li> <li>8) Bait stations are removed and the amount of stations diminished when there are no longer signs of rodent feeding or there is evidence of use by non-target <i>wildlife</i>.</li> </ol>
<p><b>3.4.4</b> Substances listed in Annex 2 as having inhalation risks are only used if restricted entry intervals are enforced and Personal Protection Equipment (PPE) is used.</p>	<ol style="list-style-type: none"> <li>a) <u>Workers</u> not handling pesticides adhere to restricted entry intervals after application of these substances as specified in criterion 4.18.</li> <li>b) Pesticide applicators of these substances comply fully with criterion 4.25, and in addition, they must use respirators with an organic vapor (OV) cartridge or canister with any N, R, P, or 100 series pre-filter.</li> </ol>
<p><b>3.4.5</b> Substances listed in Annex 2 as having risk to aquatic life are only used if non-application zones are enforced, and GA application equipment and weather conditions at the time of application are fulfilled.</p> <p><i>Critical Criterion</i></p>	<ol style="list-style-type: none"> <li>a) Minimum widths of non-application zones are: <ol style="list-style-type: none"> <li>1) Five meters, if applied by backpack sprayers;</li> <li>2) 10-20 meters, if applied by motorized sprayers or <i>spray booms</i> depending on the equipment's technical specifications;</li> <li>3) 30 meters, if applied by helicopter or airplanes.</li> </ol> </li> <li>b) GA application equipment conditions are: <ol style="list-style-type: none"> <li>1) The application equipment height above the crop is minimized;</li> <li>2) Equipment for mixing and applying agrochemicals is maintained on a regular schedule and maintenance is recorded;</li> <li>3) Liquid agrochemicals can be applied by <i>spray boom</i>, spray plane or helicopter only if wind speeds are less than 10 miles per hour (mph), and greater than 2.5 mph, and only if inversion conditions are avoided;</li> </ol> </li> <li>c) GA weather conditions for application are: <ol style="list-style-type: none"> <li>1) Application before 9 a.m. at cooler temperatures to avoid vapor drift or transport of small spray drops on convection currents;</li> </ol> </li> </ol>

	2) Windssocks or other wind direction indicators are used to avoid spraying when the wind is blowing towards natural ecosystems, housing areas or public roads.
<p><b>3.4.6</b> Substances listed in Annex 2 for <i>wildlife</i> risk mitigation are only applied if sufficient <i>wildlife</i> risk mitigation activities are implemented.</p> <p><i>Critical Criterion</i></p>	
<p><b>3.4.7</b> Substances listed in Annex 2 as having risks to pollinators can only be used if target plants are not flowering, or during the night only.</p> <p><i>Critical Criterion</i></p>	
<p><b>3.4.8</b> The introduction and spread of invasive plants are prevented, controlled and managed, and native rangeland and/or pasture forage plant communities are established and conserved.</p>	<ul style="list-style-type: none"> <li>a) Surveys are conducted and an inventory of invasive species establishes the scope of the problem.</li> <li>b) Invasive plant threats are prioritized, and weeds that are present on state or regional noxious weeds list are identified</li> <li>c) Lowest risk management options are identified, including prevention practices, opportunities for restoration or revegetation, biological weed control, controlled burning, physical removal, herbicides and other tactics.</li> <li>d) Actions are monitored and results are evaluated to determine efficacy of actions.</li> <li>e) A policy or protocol prevents the establishment and spread of priority invasive species (e.g., use of EDRR or EBIPM strategies), not just control of invasive species as problems arise.</li> </ul>
<p><b>3.4.9</b> Flies and gnat (horn, face and stable) populations are managed below action threshold densities through a low risk, integrated monitoring and management program.</p>	<ul style="list-style-type: none"> <li>a) Flies are managed primarily by prevention practices such as sanitation, removal of spilled feed and soiled bedding, and composting of manure.</li> <li>b) Avoidance practices are used, including movement of feeding sites.</li> <li>c) Animals, enclosed areas where animals are housed, and fly breeding sites are monitored for the presence of flies.</li> <li>d) Low risk suppression tactics are used, including biological control with range chickens &amp; dung beetles, and physical controls, including walk-through traps.</li> <li>e) Where chemical controls are used, they are triggered by monitoring and employ-least toxic materials (never pesticides labeled ‘Danger’ or ‘Warning’).</li> <li>f) Insecticide dust bags or oilers are located to avoid contamination of steams, wells and other water sources.</li> </ul>

<p><b>3.4.10</b> External parasite and heel flies (cattle grub) populations are treated and eliminated through a low risk, integrated monitoring and management program.</p>	<ul style="list-style-type: none"> <li>a) Prevention practices are employed including treatment of feeder stock or breeder animals before introduction to the herd, animal movement, sanitation and composting of manure.</li> <li>b) Avoidance practices are employed, including pasture management that allows for selection of location such as windy areas or wallows, and segregation of affected animals.</li> <li>c) Animals are monitored regularly and any external parasites are diagnosed to determine the course of treatment.</li> <li>d) Pesticide or pharmaceutical treatments take place in response to monitoring and diagnosis.</li> </ul>
<p><b>3.4.11</b> Rodents, their damage, and health risks associated with rodents are managed below levels of concern, and problems prevented through a low risk, integrated monitoring and management program.</p>	<ul style="list-style-type: none"> <li>a) Preventive measures such as exclusion and sanitation are used as primary management measures.</li> <li>b) Monitoring data from properly placed and serviced bait stations are recorded, and used to identify incursions and guide management decisions that reflect an understanding of risks.</li> <li>c) Suppressives measures, including predators and rodenticides, are used in response to trapping data and when levels of concern are exceeded.</li> <li>d) Traps are checked daily, and injured rodents are humanely killed.</li> <li>e) Tamper-resistant bait stations secured to posts, walls, or floors are used to enclose rodenticides.</li> <li>f) Broadcast rodenticide use is avoided.</li> <li>g) Rodenticides labeled 'Danger' or 'Warning' are not used.</li> </ul>
<p><b>3.4.12</b> Vegetative buffer areas around fields and treated weed patches reduce drift and protect adjacent natural areas and human health. Buffers comply with local regulations or Grasslands Alliance parameters, whichever are more stringent</p>	<ul style="list-style-type: none"> <li>a) Grasslands Alliance parameters are: <ul style="list-style-type: none"> <li>1) minimum barrier height is 1.5 times the crop height.</li> <li>2) Barriers are composed of plants that maintain their foliage all year, but which are permeable to airflow, allowing the barrier to capture pesticide drops.</li> <li>3) Preference is given to <u>native species</u>.</li> </ul> </li> </ul>
<p><b>3.4.13</b> Pesticide and fertilizer application equipment is maintained and calibrated, and rate is appropriate to crop and pest. Lowest recommended rate is used, weather is monitored and conditions are selected to reduce <u>spray drift</u> and volatilization.</p>	<ul style="list-style-type: none"> <li>a) Equipment for mixing and applying agrochemicals is maintained and calibrated on a regular schedule and maintenance activities are recorded;</li> <li>b) The application equipment height above the crop is minimized according to the product types and mix, nozzle type, application rates and volumes;</li> <li>c) Application equipment is equipped with spray shields or curtains at the crop edge;</li> <li>d) Liquid pesticides and fertilizers are applied by <u>spray boom</u>, plane or helicopter only if wind speeds are less than 10 mph and greater than 2.5 mph, and only if inversion conditions are avoided;</li> <li>e) Application takes place before 9 a.m. at cooler temperatures to avoid vapor drift or transport of small spray drops on convection currents;</li> </ul>

	f) Windsocks or other wind direction indicators are used to avoid spraying when the wind is blowing towards natural ecosystems, housing areas, or public roads.
<b>3.4.14</b> The storage of Grasslands Alliance prohibited pesticides listed in Annex 1 of this standard is prohibited. <i>Critical Criterion</i>	g) Annex 1 Grasslands Alliance Prohibited Pesticides that were in use before farms apply for certification are returned to the supplier; or h) Annex 1 Grasslands Alliance Prohibited Pesticides are labeled and stored separately from other products until disposed of safely.
<b>3.4.15</b> Persons or communities affected by pesticide use are identified, alerted, warned by signs, and prevented from access to application areas.	a) Visitors and neighboring communities at risk for pesticide exposure are identified. b) Operations have communicated to community members the dangers of being present on farms during applications, and the precautions to take. c) Persons and communities affected by pesticide use are alerted in advance about application areas, dates, and time periods of restricted access. d) Warning signs with symbols or other clear safety indications are placed at determined control points to prevent unauthorized persons from accessing affected areas.
<b>3.4.16</b> Animals covered by the GA certificate scope do not consist of genetically modified organisms (GMOs) and are not repackaged or processed with GMO products. <i>Critical Criterion</i>	

\*Templates for planning and record keeping will be provided

## SUB-PRINCIPLE 3.5 – Nutrient Management

*Nutrients from fertilizers, animal manure, and compost are safely stored and efficiently applied to prevent and minimize impacts to surface and groundwater quality, air quality, and soil health.*

**Objectives and outcomes of Sub-Principle 3.5:** This sub-principle applies to operations that apply fertilizer or animal manure to pasture and/or croplands, and/or that store or process manure produced on small animal feeding facilities (e.g., backgrounding and winter-feeding lots, composting). It focuses on developing and implementing a nutrient management plan that details how the operation recycles nutrients, and balances nutrient inputs with nutrient use. Manure storage and processing facilities and practices, as well as applications of synthetic fertilizers and manure, are designed and implemented to minimize impacts to surface and groundwater quality, air quality (including greenhouse gas emissions), soil health, and the health of animals, workers and communities. Application equipment is well maintained and calibrated to ensure appropriate application rates. Before biosolids from external sources are applied to pastures or crop fields, they are screened for contaminants that may pose risks to ecosystems, natural resources, public health and animal welfare.

Well-designed and effectively implemented nutrient and manure management plans generate valuable environmental, economic, and public health benefits. Utilizing soil and leaf testing to apply fertilizer and animal manure at appropriate agronomic rates creates an optimum nutrient climate for plant growth, reducing business and environmental risks associated with air, surface and groundwater pollution, thus improving water and air quality, and reducing fertilizer costs<sup>21</sup>. Effective nutrient and manure management also mitigates the external costs of pollution caused by poorly managed storage and field-application of manure, which are estimated to total \$1.16 billion per year in the U.S.<sup>22</sup>

Criterion	Indicators
<p><b>3.5.1</b> A <u>Nutrient Management Plan</u> is developed and implemented as part of the Resource Management Plan. The Nutrient Management Plan describes and documents how nutrients are recycled, and how nutrient inputs from applications of manure, <u>compost</u> and synthetic fertilizers are balanced with nutrient use.</p> <ul style="list-style-type: none"> <li>Monitoring records demonstrate locally appropriate indicators of successful nutrient management.</li> </ul> <p><i>Critical Criterion CC+3</i></p>	<p>a) The Nutrient Management Plan and associated records demonstrates how nutrients from fertilizers (synthetic and non-synthetic) and manure are applied at appropriate <u>agronomic rates</u>, times, or other practices to optimize effectiveness and address local issues of concern including negative impacts to surface and ground water quality, soil health, and air quality.</p> <p>b) Records are maintained of fertilizer and manure applications, and of natural resource monitoring results relevant to identified issues of concern.</p> <p>c) For improved pasture operations that store and/or apply animal manure to pastures or cropland, the plan documents the generation, collection, treatment, storage and agronomic use of all manure, and includes a <u>mass nutrient balance</u> for the major crop nutrients (Nitrogen, Phosphorus, Potassium – N,P,K) that takes into account inputs from water, soil amendments, nitrogen-fixing crops, existing soil and plant tissue.</p> <p>1) Annual soil and/or plant tissue testing informs agronomic application rates, with all pastures and fields tested within a 3 year period.</p>

**3.5.2** Manure storage and on-operation management of stored manure avoids and minimizes impairment of surface and groundwater quality, air quality, soil health, and the health of livestock, workers and communities.

**NA:** No manure is stored on the operation.

**1. All Operations**

- a) Manure storage capacity is adequate to contain all manure produced when uptake of application is inhibited or runoff is enhanced (e.g., frozen or saturated soils);
- b) Storage is designed so that runoff from the storage site is contained and utilized;
- c) Storage structures are monitored and inspected annually and maintenance action is taken to repair cracks and other faults that may lead to contamination of surface and/or ground water;
- d) Manure is stored at least 100 feet away from surface waters (farther where required by law/local ordinance), and not in areas subject to flooding, including within a 100 year flood plain;
- e) Setbacks, berms, or vegetated buffers separate manure pile(s) and waste storage areas from neighboring waterways and tile drain inlets within 100 feet (or as suitable given local soils, geology and topography). These may include grass or vegetated filter strips, terraces, manmade wetlands, or riparian buffers.
- f) Manure is stored downwind of sensitive areas.
- g) Excess manure, if any, is put to good use off-site. Records are kept documenting the amount of manure exported and the name and address of individuals receiving the manure.
- h) Runoff catchment basins are sited, designed and managed to prevent surface and groundwater pollution.

**2. Additionally for operations that store solid manure:**

- a) A majority of the operation's stored manure is composted and used as fertilizer.
  - 1) All manure and compost is stored on an impermeable surface;
  - 2) Compost is actively managed, and a proper blend of Carbon and Nitrogen sources is available for microbial action;
  - 3) In high rainfall areas, compost is covered to prevent runoff from the manure and over-saturation of composting manure.

**3. Additionally for operations that store liquid and slurry manure:**

- a) Liquid manure storage facilities are designed and maintained utilizing infrastructure and practices to prevent leakage and breaches.
- b) Manure liquids are stored in impermeable lagoons, ponds or runoff catchment basins (made from synthetic material or earthen with plastic-liner) that are sited, designed and managed to prevent surface and groundwater pollution.
  - 1) Liners and lagoon walls are well-maintained (e.g., no woody vegetation growing on them, herbaceous vegetation is well maintained; no other risks that could cause seepage or catastrophic breaching);
  - 2) Storage capacity is adequate to contain all manure produced during periods when sprayfield application is not appropriate or possible (e.g. frozen or saturated soils, during rain events);

	<p>3) Liquid waste storage and processing facilities are designed and maintained to withstand 100+ year/24 hour storm event; Lagoon floors are above the high water table</p> <p>c) Manure storage facilities are designed and managed to capture and/or limit emissions of methane, ammonia, VOC/odor, and other air pollutants identified as an issue of concern.</p> <p>d) Off-site disposal and use:</p> <ol style="list-style-type: none"> <li>1) Liquid/Slurry is piped or hauled to a municipal wastewater treatment plant (or treated using waste management options such as aerated bioreactors or anaerobic digesters)</li> <li>2) Records are kept documenting the amount of manure exported and name and address of recipients</li> </ol> <p><b>4. For operations with permitted backgrounding and/or winterfeeding lots:</b></p> <p>a) A plan is in place to prevent impairment of surface and groundwater quality, soil health, and air quality by potentially toxic contaminants in manure: pathogens, heavy metals, pesticides, pharmaceuticals, estrogenic hormones;</p> <p>b) Operation aims for net zero discharge, including by converting waste into fertilizer, compost, and/or bioenergy utilized by the operation and neighboring farms.</p> <p>c) Annual and post-storm event (intensity TBD) third party monitoring of <u>surface waters</u> immediately upstream of and downstream from manure storage and land application areas enables early detection and rapid response to surface water contamination by discharges and minimize adverse impacts/associated costs: BOD, TSS/electrical conductivity, fecal coliforms, specified pesticides, additional measures as per identified risks.</p> <p>d) Where issues of concern are identified, annual monitoring of <u>groundwater</u> immediately upstream of and downstream from manure storage and land application areas (at least annually at stockpile and surface impoundments) enables early detection and rapid response to groundwater contamination and minimizes adverse impacts and associated costs: NO<sub>3</sub>, metals (arsenic), specified pesticides, additional measures as per identified risks.</p>
<p><b>3.5.3 Applications of <u>non-synthetic inputs</u> (e.g. manure, compost, green manures) do not impair surface and groundwater quality, air quality, or soil health.</b></p> <ul style="list-style-type: none"> <li>• Records are kept of dates, locations, amounts, and rates of application.</li> </ul>	<p>a) All non-synthetic inputs used on the farm are applied in accordance with the Nutrient Management Plan.</p> <p>b) Application techniques for non-synthetic inputs minimize the risk of contamination to aquatic ecosystems, groundwater, the atmosphere, soil health, or other crops.</p> <p>c) Non-synthetic inputs are not applied when uptake of application is inhibited and/or runoff is enhanced.</p> <p>d) Buffers are appropriate to protect surface waters, tile drains, domestic water supply wells and natural habitats from runoff of non-synthetic inputs, given local climatic and environmental conditions.</p> <p>e) Applications of non-synthetic inputs are monitored closely to avoid odor nuisance issues with neighbors.</p>

	<ul style="list-style-type: none"> <li>f) Winter pastures and feeding areas are harrowed in the spring after soils dry to incorporate non-synthetic inputs.</li> <li>g) Off-farm applications of manure are under the control of a manure agreement that guides applications through accompanied manure, soil, and/or plant tissue test results.</li> </ul>
<p><b>3.5.4</b> Applications of <u>synthetic fertilizers</u> to improved pastures, grazed croplands and crops do not impair surface and groundwater quality, air quality, or soil health.</p> <ul style="list-style-type: none"> <li>• Records are kept of dates, locations, amounts, and rates of applications.</li> </ul>	<ul style="list-style-type: none"> <li>a) Synthetic fertilizer application techniques minimize the risk of contamination to aquatic ecosystems, groundwater, the atmosphere, soil health, or other crops. Where appropriate, synthetic fertilizers are incorporated or injected into the soil, rather than broadcasted, to prevent nutrient runoff, groundwater pollution, or volatilization;</li> <li>b) Fertilizers are selected and applied in accordance with crop needs and soil characteristics, based on an assessment of soils or plant nutrient status: <ul style="list-style-type: none"> <li>1) Fertilizer quantity is matched to the needed amount, in accordance with the crop and foliar assessment or in accordance with the recommendation of national crop specific authorities;</li> <li>2) Fertilizer application rates are determined by soil and/or plant tissue tests;</li> <li>3) Fertilizer application is timed to make nutrients available only when the crops need them;</li> <li>4) Slow release fertilizers are utilized whenever available and economically feasible.</li> </ul> </li> <li>c) Records show that use of synthetic fertilizers is gradually being reduced, with Nitrogen (N), Phosphorus (P) and/or Potassium (K) met through use of non-synthetic inputs.</li> </ul>
<p><b>3.5.5.</b> Application equipment is well-maintained and is calibrated before and during fertilizer application to ensure accurate application rates for given nutrient amendments.</p> <ul style="list-style-type: none"> <li>• Records are kept for application equipment maintenance and calibrations.</li> </ul>	<ul style="list-style-type: none"> <li>a) Application equipment is calibrated to deliver desired amount of material; <ul style="list-style-type: none"> <li>1) Inspection of manure management and spraying equipment for leaks occurs annually or per identified issues of concern;</li> </ul> </li> <li>b) Application equipment is designed and maintained to prevent spillage.</li> <li>c) Filling sites are designed and maintained to allow effective spill cleanup. Spills are cleaned promptly.</li> <li>d) Fertilizers and manures are not applied through overhead sprinklers or big guns. Splash plates are located no higher than four feet above the ground;</li> <li>e) All application equipment running on moist soils is fitted with tires designed to minimize soil compaction.</li> <li>f) Commercial fertilizers and animal manure is not tracked onto public ways by equipment.</li> </ul>
<p><b>3.5.6</b> <u>Biosolids</u> from external sources are screened for <u>heavy metal</u>, <u>pathogen</u>, <u>pharmaceutical</u>, and contaminants of local concern</p>	<p><b>N/A:</b> no biosolids from external sources are applied</p> <ul style="list-style-type: none"> <li>a) Operations that apply biosolids from external sources to pasture and/or cropland must secure documentation of testing by the biosolids provider or test biosolids themselves for contaminants and maintain application records.</li> </ul>

before application to pastures and/or crop fields.	b) A soil test must be completed and passed every 3 years that includes an assay for heavy metal, pathogen, pharmaceutical, and contaminants of local concern.
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## Sub-Principle 3.6 – Waste Management

*Beef operations reduce and manage waste for disposal to avoid negative impacts to soils, water, biodiversity and human communities.*

**Objectives and outcomes of Sub-Principle 3.6:** This sub-principle recognizes operations that minimize generation of solid waste through reducing, reusing, recycling and composting materials, and by sourcing materials and inputs that minimize waste byproducts (e.g., purchasing in bulk, products that utilize recyclable or reusable containers). Waste storage, treatment and disposal facilities (including septic systems, wastewater storage facilities, drain fields and seep pits) are sited, designed and maintained to prevent adverse impacts to ecosystems, workers and communities, and to mitigate pollution related risks. Operations are kept clean and free of litter, reducing related health, safety and environmental hazards.

Criterion	Indicators
<p><b>3.6.1</b> <u>Waste</u> destined for disposal is reduced through recycling, reuse, and changes to farm management, production, and processing.</p>	<ul style="list-style-type: none"> <li>a) Types and amounts of waste are identified, including <u>hazardous materials</u>.</li> <li>b) Priority is given to product suppliers that minimize waste associated with their products, and that receive used packaging and containers for reuse or recycling.</li> <li>c) Information on waste generation and reduction efforts are analyzed at least annually. Improvements and corrective actions are incorporated into operations and production management plans, and implemented.</li> <li>d) Organic waste from processing areas is applied to production areas or grounds and/or processed in accordance with the nutrient management plan.</li> </ul>
<p><b>3.6.2</b> <u>Waste</u> storage, treatment and disposal mechanisms are sited, designed and managed to prevent or minimize impacts on communities and workers, natural ecosystems, and soils.</p>	<ul style="list-style-type: none"> <li>a) Impacts include those on natural ecosystems, soils, and housing and other areas of worker activity.</li> <li>b) No burning of household waste, plastics, recyclables, and other materials that release toxins or pose other health risks when burned.</li> </ul>
<p><b>3.6.3</b> Septic systems, seep pits, and drain fields receiving domestic wastewater from housing, lavatories, kitchens, and washing facilities are designed to avoid contamination, based on the <u>waste water</u> volume and soil characteristics.</p>	<ul style="list-style-type: none"> <li>a) Drain fields and seep pits are not used in soils with permanently or seasonally high water tables, in heavy clays or soils with other impermeable layers that impede drainage, or in sandy soils that may permit rapid percolation of wastewater into groundwater.</li> <li>b) Septic systems are sited to protect flowing and still <u>water bodies</u> and <u>wetlands</u>.</li> <li>c) Wastewater with toxic components, such as pesticide application equipment wash water, is not treated in underground septic systems, seep pits or drain fields.</li> </ul>
<p><b>3.6.4</b> Properties are kept clean and free of litter or <u>waste</u> accumulations outside of</p>	<ul style="list-style-type: none"> <li>a) Identified receptacles for disposal of waste and recyclable/compostable materials are available in areas of human activity, and are emptied on a regular basis.</li> </ul>

designated storage and disposal sites.	<ul style="list-style-type: none"><li>b) Waste from processing plants is removed to designated areas away from the processing plant on a daily basis and is not left overnight.</li><li>c) Metal and plastic scrap materials that can feasibly be reused in the future are maintained in designated areas away from processing plants and housing, and access to them is controlled.</li></ul>
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## PRINCIPLE 4 – Improved Livelihoods and Well Being

*Beef operations develop and implement employment policies that promote safe and fair working conditions and establish open channels for communicating with employees about issues such as workplace safety and job satisfaction. They provide incentives and opportunities for the development of employee skills and incorporate quality of life issues into daily decision making for their employees and local communities.*

**Objectives and outcomes of Principle 4:** This Principle ensures the livelihoods, safety and well-being of employees and their communities, above and beyond those protections granted by law. Discrimination is prohibited and labor policies are clearly communicated. Compulsory and child labor are both prohibited, although children may participate in tasks and chores appropriate to their age and the scope of the operation. Careful storage of agrochemicals protects workers from unintentional exposure. Where appropriate, PPE is provided for workers. All restricted entry intervals, quarantine and pre-harvest periods are observed. Response plans are developed for possible emergencies such as extreme weather events, natural catastrophes (lightning strikes, earthquakes, storms, and floods), or fire, and personnel are trained to implement those plans.

Criterion	Indicators
<p><b>4.1</b> Labor policies are written, posted and communicated to all workers and complaints or grievance mechanisms to protect workers' rights are implemented.</p> <p><i>Critical Criterion</i></p>	<p>a) All workplace policies and job expectations are clearly communicated to employees at time of hire.</p> <p>b) Where the operation employs more than 5 employees, a written employee manual is maintained, updated as necessary, and distributed to all employees.</p> <p>c) Complaints or grievance mechanisms for workers include a system to file complaints and document responses, and a periodic evaluation of its effectiveness.</p> <p>d) Workers who file complaints are protected from retaliation.</p> <p>e) A uniform disciplinary process is in place and is communicated clearly to workers, including a stepped progressive disciplinary process leading to termination of employment for cause.</p>
<p><b>4.2</b> All forms of forced or compulsory labor are prohibited, including</p> <ul style="list-style-type: none"> <li>• Use of trafficked labor</li> <li>• All forms of verbal, physical or psychological abuse, violence or measures that include sexual abuse or harassment</li> <li>• Use of extortion, debt, threats, monetary fines or penalties</li> <li>• Labor by prisoners.</li> </ul> <p><i>Critical Criterion</i></p> <p>According to ILO Forced Labor Convention (No. 29) and Abolition of Forced Labor Convention (No. 105))<sup>3</sup></p>	<p>Forced or compulsory labor includes:</p> <p>a) Forcing workers to work or stay at the workplace, preventing them from being hired or from continuing to work, including for poor performance or for violating company rules, regulations, and policies;</p> <p>b) Control of worker access to food, water, toilets, canteens, medical care or health clinics as a means to discipline or reward workers;</p> <p>c) Withholding workers' salaries, documents, IDs, benefits, property or any rights acquired in the course or due to the status of work or stipulated by law;</p> <p>d) Restricting the workers' freedom of movement to and from their employer-provided housing, unless such movement would compromise the residents' security;</p> <p>e) Labor by prisoners or those working under the regimen of imprisonment, even when permitted by local regulations or other laws.</p>

<p><b>4.3</b> All forms of discrimination in labor, hiring, training, task assignment, labor benefits, promotion policies and procedures, and other opportunities for better conditions or advancement are prohibited, including</p> <ul style="list-style-type: none"> <li>• Any distinction, exclusion or preference to invalidate or harm equality of opportunity or treatment in employment;</li> <li>• Different pay for work of the same or equivalent task;</li> <li>• Influencing opinions and convictions, views or affiliations of workers.</li> </ul> <p><i>Critical Criterion</i></p> <p>(According to ILO Conventions 100 and 111)</p>	<p>Includes discrimination based on:</p> <ol style="list-style-type: none"> <li>a) Race, color, sex, sexual orientation, gender, religion, political opinion, national extraction or social origin;</li> <li>b) Nationality or migratory status;</li> <li>c) Third party affiliation;</li> <li>d) Civil status;</li> <li>e) Medical condition or disability;</li> <li>f) Family condition, including pregnant women and parents with children, or any other protected status as included in national laws;</li> <li>g) Different pay for work of equal value;</li> <li>h) Unequal opportunities for gender when appointing management positions;</li> <li>i) Efforts to influence political, religious, social, sexual or cultural opinions and convictions, views or affiliations of workers.</li> </ol>
<p><b>4.4</b> Workers have the right to establish and join <u>worker organizations</u> of their own free choice without employer influence and interference. Worker organizations operate without interference or influence by farm management or owners. Workers have the right to voluntarily negotiate their working conditions in a collective manner and are protected against acts of discrimination or retaliation for reasons of affiliation.</p> <p><i>Critical Criterion</i></p> <p>(Freedom of Association according to ILO Convention 87, Collective Bargaining according to ILO Convention 98 concerning the Application of the Principles of the Right to Organize and to Bargain Collectively)</p>	<ol style="list-style-type: none"> <li>a) Worker organizations have the right to freely write their constitutions and rules, elect their representatives, organize their administration and activities and develop and implement their positions and programs;</li> <li>b) Worker organizations have the right to affiliate with international worker organizations;</li> <li>c) Full independence means being protected against any acts of interference in the worker organization’s establishment, functioning or administration including:       <ol style="list-style-type: none"> <li>1) Acts designed to promote the establishment of workers' organizations under the domination or interference of employers or employers' organizations;</li> <li>2) Support worker organizations by financial or other means, with the object of placing such organizations under the control of employers or employers' organizations;</li> <li>3) Workers’ organization representatives have free access to the farm or related infrastructure for organizational activities and membership representation.</li> </ol> </li> <li>d) Voluntary negotiation between workers and worker organizations is enabled by means of collective agreements with respect to regulation of terms and conditions of employment;</li> <li>e) In the case of employers with a number of employees less than the minimum required by the local legislation to create a worker organization, other effective communication mechanisms between workers and farm or group administrator management are implemented;</li> <li>f) Acts of discrimination for reasons of affiliation with worker organizations include dismissal of or prejudice against a worker by</li> </ol>

	reason of worker organization membership, organizing or participating in worker organization activities.
<p><b>4.5</b> All workers receive no less than the legal minimum wage or wages negotiated voluntarily and employers respect legal specifications about in-kind payment. Management-required training takes place during the normal workday and is fully compensated.</p> <p><i>Critical Criterion</i></p>	<ul style="list-style-type: none"> <li>a) The legal minimum wage corresponds to the highest official minimum wage defined and published by the government authority for a specific task or occupation defined at the national, regional, state or local level;</li> <li>b) For production, quota or piece work, the established pay rate allows workers to earn at least a minimum wage based on average working conditions and productivity. If under these conditions, the piecework rate does not meet the daily minimum wage, then it is upgraded to at least the daily minimum wage;</li> <li>c) If wages are negotiated by a voluntary negotiation between employers and workers' organizations, those negotiated wage amount(s) apply to all workers covered under the negotiation's agreement provided these wages are not below the legal minimum wage;</li> <li>d) If the law permits remuneration to be paid by in-kind payments, the worker may reject these payments and receive full remuneration in cash. In the case of in-kind payments, these reflect the market prices of in-kind items;</li> <li>e) Farms maintain a registry of all workers indicating worker name, gender, hire date, job type or description, number of regular working hours per period, and gross and net pay for regularly worked hours.</li> </ul>
<p><b>4.6</b> Payment policies and procedures guarantee the complete payment to workers of all of their wages due, on the date and in the place agreed upon in the labor contract, including overtime work. Workers have the right to object to their received payment and have their objections reviewed and decided with decisions being documented.</p>	<ul style="list-style-type: none"> <li>a) Upon being given an offer of employment, all workers are informed about all conditions and terms of work contained in the proposed labor <u>contract</u> or collective bargaining agreement;</li> <li>b) Workers receive a written detailed and comprehensive explanation of the wages paid and of any deductions made. In cases where the worker is unable to read this document, provision is also made to explain the document contents verbally;</li> <li>c) Worked hours and pay rates are recorded for each worker for the type of work performed. For piece rates or production work, workers' output or production in agreed upon units and the pay rate is recorded;</li> <li>d) Payment takes place at the workplace, or by another arrangement convenient to and agreed upon with the worker;</li> <li>e) Tools and equipment necessary for worker performance of their duties (including personal protective equipment) are provided by the employer free of charge to workers for use on the job;</li> <li>f) Migrant workers from other countries are only employed if they have a valid work permit issued by the official government agency.</li> </ul>
<p><b>4.7</b> The regular working hours of all workers do not exceed 48 hours in the week and eight hours in the</p>	<ul style="list-style-type: none"> <li>a) Workers have at least one full day of rest for every six consecutive days worked.</li> </ul>

<p>day<sup>1</sup> or, if lower, the maximum amount of hours specified by local regulation. Workers have daily meal and rest periods. All overtime is voluntary, not continuous and does not exceed 12 hours per week.</p>	<ul style="list-style-type: none"> <li>b) All workers have annual paid vacation leave equivalent to a minimum of one day earned for each month worked (12 days or 2 work weeks per year) or the equivalent for part-time workers.</li> <li>c) If there is no legally mandated overtime wage level applicable, all overtime hours are paid at a higher rate than regular working hours.</li> <li>d) Workers have minimum one meal period for every six hours worked.</li> </ul>
<p><b>4.8</b> Fully-paid maternity leave is at least 12 weeks and includes no less than a six week period after birth. Flexible working arrangements are offered to pregnant or nursing women. Pregnant women are not assigned to activities that involve exposure to pesticides.</p>	<ul style="list-style-type: none"> <li>a) If a worker’s pregnancy indicates a different, more protective job assignment during her pregnancy, her remuneration is not reduced during that period.</li> </ul>
<p><b>4.9</b> Arrangements or practices in order to avoid legally mandated pay and benefit obligations are prohibited. <i>Critical Criterion</i></p>	<ul style="list-style-type: none"> <li>a) Arrangements include different mechanisms to continually hire workers on a short-term basis for permanent tasks, such as tenant farm arrangements or the formation of professional service structures.</li> <li>b) Temporary workers are provided with legally mandated labor benefits.</li> </ul>
<p><b>4.10</b> Employer assists workers in gaining access to suitable housing and locating family support services.</p>	<ul style="list-style-type: none"> <li>a) Housing provided to workers and their families protects against the weather and is clean, safe, and not detrimental to dwellers’ health.</li> <li>b) If the employer does not provide worker housing, employer refers workers to community resources for housing.</li> <li>c) Employer refers workers to community resources for health and welfare information.</li> </ul>
<p><b>4.11</b> Workers are encouraged to improve their skills and contribute to improving the operation.</p>	<ul style="list-style-type: none"> <li>a) Workers are recognized and supported for contributing input for workplace improvement.</li> <li>b) Workers are encouraged to pursue workforce development and training, as appropriate and where available.</li> </ul>
<p><b>4.12.</b> For year-round workers, the employer provides benefits as suitable to the scale the operation.</p>	<ul style="list-style-type: none"> <li>a) Employer provides unemployment and/or workers compensation insurance.</li> <li>b) Employer provides other benefits, which may include but are not limited to: <ul style="list-style-type: none"> <li>1) Health, disability and/or life insurance</li> <li>2) Subsidized or provided transportation for workers</li> <li>3) Sick and/or vacation pay</li> <li>4) Subsidized or reduced housing costs</li> <li>5) Bonus wages for outstanding performance</li> </ul> </li> </ul>

<sup>1</sup> ILO Convention 30 concerning the Regulation of Hours of Work in Commerce and Offices

<p><b>4.13</b> Non-employees are kept out of the workplace and off the grounds unless accompanied by operation manager or suitable employee.</p>	<p>a) An exemption may be made for family members; however children of the employer or worker families under 12 must be supervised when around the workplace area and grounds.</p>
<p><b>4.14</b> Exploitation of <u>children</u> is prohibited, including:</p> <ul style="list-style-type: none"> <li>• Work that harms the health, safety or morals of children, or is too physically hazardous for children</li> <li>• All forms of slavery or practices similar to slavery</li> <li>• Use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances</li> <li>• Use, procuring or offering of a child for other illicit activities.</li> </ul> <p><i>Critical Criterion</i></p>	<p>a) Types of work too physically hazardous for children include:</p> <ol style="list-style-type: none"> <li>1) Handling of pesticides, hazardous substances or residues;</li> <li>2) Operating or assisting to operate power machinery or tools;</li> <li>3) Activities requiring strong physical exertion, such as heavy lifting;</li> <li>4) Work on steep slopes, near steep cliffs or drop-offs, on any high surface or in high places;</li> <li>5) Work in storage areas, silos and construction sites;</li> <li>6) Night work.</li> </ol> <p>b) Slavery comprises:</p> <ol style="list-style-type: none"> <li>1) The sale and trafficking of children;</li> <li>2) Debt bondage and serfdom;</li> <li>3) Forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict;</li> </ol> <p>c) Illicit activities cover the production and trafficking of drugs as defined in the relevant international treaties;</p> <p>d) Any type of paid or unpaid work by a child under the age of 12 years old is prohibited, except tasks that are traditional to ranch/farm families with children and local culture.</p> <p>e) Young workers do not work after nightfall, during school hours (if legally subject to compulsory schooling) or more than eight hours per day. In all circumstances, the total sum of young workers' work, school attendance and transportation hours does not exceed eight hours per day.</p>
<p><b>4.15</b> <u>Young workers</u> may work only if permitted by law and if not working during legally compulsory school hours.</p> <p><i>Critical Criterion</i></p>	<p>a) For each young worker, the following information is recorded:</p> <ol style="list-style-type: none"> <li>1) First and last name;</li> <li>2) Date and reliable proof of date of birth;</li> <li>3) Parent(s) or legal guardian(s) first and last name and domicile or place of contact;</li> <li>4) Parent(s) or legal guardian(s) consent and authorization for the young worker's employment;</li> <li>5) Type of assigned work or tasks;</li> <li>6) Number of daily and weekly working hours.</li> </ol>
<p><b>4.16</b> Workshops, storage and processing facilities are designed, equipped, and managed to reduce the risk of accidents and negative impacts on human health and the environment.</p>	<p>a) Worksites are designed and equipped in accordance with the type of substances and materials and have sufficient light and ventilation, and have equipment for fire-fighting and attending spills;</p> <p>b) Only authorized personnel have access to these areas;</p> <p>c) All hazards and hazardous areas are identified by warning signs that indicate the type of hazard and any necessary precautionary measures;</p>

	<ul style="list-style-type: none"> <li>d) Working emergency showers and eye-washing facilities are accessible for all workers that handle pesticides or other <u>hazardous materials</u>;</li> <li>e) Fuels and other flammable substances, personal protection equipment, or food are not stored with pesticides, fertilizers or other <u>hazardous materials</u> or residues;</li> <li>f) Chemical containers and application equipment are stored in dry, well ventilated conditions and protected from sunlight and extreme temperatures;</li> <li>g) Materials are stored safely and Material Safety Data Sheets (MSDS) for each stored chemical are kept in the storage facility</li> </ul>
<p><b>4.17</b> All farmers and workers mixing or handling pesticides, fertilizers or hazardous material, or operating or maintaining hazardous machinery or tools, use Personal Protection Equipment (PPE) in accordance with the product’s MSDS, safety tag or instructions.</p>	<ul style="list-style-type: none"> <li>a) All equipment is replaced or repaired if damaged or worn;</li> <li>b) Gloves, boots, masks and respirators fit the user’s body;</li> <li>c) All PPE and clothing for workers is washed and stored on the farm, and does not enter worker housing.</li> </ul>
<p><b>4.18</b> Restricted entry intervals, quarantine and pre-harvest periods for pesticides listed in Annex 2, or stipulated in the product’s MSDS, label or security tag are implemented for pesticide applications.</p>	<ul style="list-style-type: none"> <li>a) When two products with different restricted entry or pre-harvest intervals are used at the same time, the longest interval and the strictest quarantine procedures are applied;</li> <li>b) In cases where PPE is not used, or unavailable, the intervals specified in Annex 2 apply;</li> <li>c) In cases where PPE is available and used, either the restricted entry interval stipulated in the product’s MSDS, label, or security tag applies, or the WHO-recommended interval below, whichever is the longer;</li> <li>d) For pesticides without information about <u>restricted entry periods</u>, the following applies: <ul style="list-style-type: none"> <li>1) WHO class Ia: 72 hours</li> <li>2) WHO class Ib: 48 hours</li> <li>3) WHO class II: 24 hours</li> <li>4) WHO class III and IV: 6 hours</li> </ul> </li> </ul>
<p><b>4.19</b> Operation provides for sanitation, and general safety and welfare of workers.</p>	<ul style="list-style-type: none"> <li>a) Sheltered areas for food storage, rest and meal periods are provided.</li> <li>b) Safe drinking water is provided.</li> <li>c) Toilets with hand washing facilities are accessible.</li> <li>d) Employer provides workers with shower facilities with warm water.</li> <li>e) Safety training or educational materials are provided.</li> <li>f) Employer sets safety goals, tracks performance.</li> </ul>
<p><b>4.20</b> Possible emergency scenarios are identified and emergency procedures, training and equipment defined for each of these emergencies.</p>	<ul style="list-style-type: none"> <li>a) Possible emergencies include extreme weather events, natural catastrophes (lightning strikes, earthquakes, storms, and floods), civil unrest or fire;</li> <li>b) Personnel are trained and appointed as specialists in emergency response.</li> </ul>

## PRINCIPLE 5 – HEALTHY AND HUMANE TREATMENT OF ANIMALS

*Beef operations treat livestock with care and respect, minimizing animal fear and stress during handling, transportation and slaughter. Livestock are provided fresh water, a healthy diet, shelter from extremes of temperature, adequate space and the opportunity to engage in natural behaviors, and have social contact with other animals.*

**Objectives and outcomes of Principle 5:** This principle recognizes that healthy and humane treatment of livestock increases triple bottom line benefits for producers. Compliance with this principle ensures good animal health from birth to slaughter through record-keeping, proper nutrition, prompt resolution of health issues, low-stress handling, and overall good animal husbandry. Animals are not given non-therapeutic antibiotics (in feed or water), and do not receive beta-agonists or growth-promoting hormones. Producers practice responsible animal husbandry through animal welfare and herd health programs. Infrastructure and handling facilities are well-maintained, and ensure the safety of animals and handlers, and transportation to/from facilities is conducted safely and humanely.

Criterion	Indicators
<p><b>5.1</b> An individual animal identification record system for <u>cattle</u> is established and applied from birth or arrival until sale or <u>death</u>. <i>Critical Criterion</i></p>	<p>a. Identification records exist from birth or arrival on the property (with origin and date) until sale (with destination and date) or death, and enables identification of individual animals.</p> <p>b. Identification follows through sales and enables traceability throughout the animal’s life.</p> <p>c. For purchased animals, past identification records are tracked and maintained for at least one year after sale or death.</p>
<p><b>5.2</b> Animals are raised on Grasslands Alliance certified grazing operations:</p> <ul style="list-style-type: none"> <li>• from birth to harvest,</li> <li>• from birth until removal from grazing operations, or</li> <li>• for the last one year (12 months) of their life.</li> </ul> <p><i>Critical Criterion CC+3</i></p>	<p>Verification documents should include:</p> <p>a. certification documentation</p> <p>b. bills of sale</p>
<p><b>5.3</b> Cloned animals or their progeny are not permitted. Genetically modified animals or their progeny are not permitted. <i>Critical Criterion</i></p>	
<p><b>5.4</b> Mistreatment or abuse of cattle or working animals is prohibited.</p>	<p>a) No mistreatment or abuse covers:</p> <ol style="list-style-type: none"> <li>1) No use of sharp objects on animals;</li> <li>2) No misuse of <u>irritating substances</u>, including potash for branding;</li> </ol>

<p><i>Critical Criterion</i></p>	<ol style="list-style-type: none"> <li>3) Not moving animals in a pain-inflicting way;</li> <li>4) No electrification of wire at voltage levels harmful to cattle or wildlife.</li> </ol> <p>b) Sick animals are provided necessary treatment, and cover if needed.</p>
<p><b>5.5</b> Animal handling and treatment activities are conducted by trained personnel and reduce fear, stress and pain.</p> <ul style="list-style-type: none"> <li>• Animals suffering from injuries or illnesses from which they are unlikely to recover are euthanized as quickly and painlessly as possible.</li> </ul>	<ol style="list-style-type: none"> <li>a) Animal handlers are well trained and understand the natural behaviors and factors that cause stress or injury to the livestock under his or her care.</li> <li>b) Animals do not show fear or stress, e.g., rushing to escape or running into each other during handling or transport operations, excessive vocalization, etc.</li> <li>c) Animal handlers show no evidence of raised voices or aggressive actions evident during inspection.</li> <li>d) Handling facilities are in good repair and show no evidence of fear or stressed behavior, such as bowed panels, smashed gates, etc.<sup>23</sup></li> <li>e) If stock dogs are used to move cattle, the dogs are under control and do not cause injury or undue stress to the cattle.</li> <li>f) Farm operators, farm employees or other individuals conducting treatments and/or applying identifiers, including branding, are properly trained so as to avoid injuring animals or causing undue stress during the application process.</li> <li>g) Electric prods are not used, except when their use is the only option for ensuring the safety of animals and/or handlers, and this occurs on less than 2% of the animals handled.</li> <li>h) Treatment of sick, injured, dying animals: <ol style="list-style-type: none"> <li>1) Non-ambulatory, dying, diseased and disabled animals are provided shelter, food and water.<sup>24</sup></li> <li>2) Animals are rendered insensible to pain before being shackled, hoisted, thrown, cast away, or cut.</li> <li>3) Insensibility must come from a single blow, gunshot or knife stroke, or an electrical, chemical or other means that is rapid and effective.</li> <li>4) Non-ambulatory animals are never dragged to the kill area. <ol style="list-style-type: none"> <li>i) Plans for carcass disposal are in place, and carcass disposal complies with all local regulations. Options provided by these laws may include burial, composting, or other techniques.</li> </ol> </li> </ol> </li> </ol>
<p><b>5.6</b> The herd health plan is implemented and proven effective through recordkeeping.</p> <ul style="list-style-type: none"> <li>• Livestock appear healthy and free of disease and/or severe problems with parasites.<sup>25</sup> There is no evidence of unresolved health issues.</li> </ul> <p><i>Critical Criterion CC+3</i></p>	<ol style="list-style-type: none"> <li>a) Animals are regularly monitored for injury, disease or abnormal behaviors. Any indications are addressed promptly and adequately, including through the use of isolation and/or professional veterinary assistance, and correction of causal factors when necessary.</li> <li>b) Facilities for isolating sick animals are available and adequate to allow normal movement.</li> <li>c) Animal identifiers (e.g., bands, tags, brands) are applied safely and carefully, and are checked regularly to avoid animal discomfort. If temporary markings are used, they must be non-toxic.</li> <li>d) Severe physical alterations are not allowed.</li> </ol>

	<p>e) Where calving is done on the operation, appropriate calving equipment is accessible and in good repair. Emergency information is easily accessible. Where calving is done in pens or pastures, the producer/manager can describe procedures to prevent stress to calves &amp; transmission of disease.</p> <p>f) Castration is conducted at the earliest age possible to minimize stress and pain. Only surgical methods or banding are used for castration. Practices to ensure proper restraint, sanitation and administration of band or surgical castration are met.</p> <p>g) If flank spaying is necessary, the procedure is performed by a veterinarian or trained professional, and the animal is treated with pain relief medication during and after spaying.</p> <p>h) Calves are weaned no earlier than 6 months, using practices that minimize stress and ensure health.</p> <p>i) Dehorning/disbudding is done within 4 months of age using either chemical or hot iron processes, with pain relief supplied for older animals. Older calves and adult animals may have their horns tipped but cannot be dehorned/disbudded unless medically indicated.</p>
<p><b>5.7</b> Breeds are selected that maximize productivity and disease resistance in the local environment, and are adapted to local climate and geography.</p> <ul style="list-style-type: none"> <li>• Breeding cattle are selected for reproductive traits including low birth weight bulls, calving ease, milk production, calf protection and defense.</li> <li>• Records of reproduction periods, calving dates and other activities are kept, and substantiate reduction or elimination of negative genetic traits and negative impacts of inbreeding.</li> </ul>	
<p><b>5.8</b> Cattle are supplied with <u>consumable water</u> in sufficient quality and quantity to ensure health and wellbeing.</p> <p><i>Critical Criterion</i></p>	<p>a) Water is continuously available to animals in quantities sufficient to avoid symptoms of animal dehydration.</p> <p>b) Water accessible to animals for drinking does not contain amounts of contaminants, coliforms or chlorine detrimental to cattle health and well-being.</p>
<p><b>5.9</b> Nutritional needs of animals are met. Animals appear well fed with good body fitness (determined by using <u>body condition score</u>), as appropriate for the breed and life-</p>	<p>a) Feed and water stations are well maintained and clean water is freely available on a daily basis.</p> <p>b) Animals are supplied with adequate drinking water and feed to ensure animal health and well-being.</p> <p>c) No stress from competition for food or water is apparent.</p>

<p>stage of the animal, and for the level of production.</p>	<p>d) Appropriate <u>mineral supplements</u> (salt licks and/or loose minerals) are available if minerals are not otherwise provided.<sup>26</sup></p> <p>e) Feed and water supplies are adjusted to meet age-specific needs and specific needs of breeding stock.</p> <p>f) Newborns are fed with <u>colostrum</u> and consume milk until their development allows for digestion of fodder.</p> <p>g) Records indicate breeding stock experience normal reproductive potential for the region.</p> <p>h) Operations Plan includes strategy for supplying cattle with feed and water in an emergency such as an extended storm or drought.</p>
<p><b>5.10</b> Feed, <u>feed supplements</u>, water, or other products containing the following substances are not supplied to cattle:</p> <ul style="list-style-type: none"> <li>• Animal by-products originating from mammals, birds, or fish</li> <li>• Animal or human excrement</li> <li>• Antibiotics, beta-agonists or hormones</li> </ul> <p><i>Critical Criterion</i></p>	
<p><b>5.11</b> Administration to cattle of substances prohibited by Grasslands Alliance is not permitted.</p> <p><i>Critical Criterion</i></p>	<p>a) Antibiotics cannot be used for purposes other than treatment of disease diagnosed by a licensed veterinarian, or, in limited circumstances, to control a disease outbreak in a herd. Use of antibiotics for feed efficiency, promotion or maintenance of growth, routine disease prevention, or reduction in number or incidence of liver abscesses is prohibited;</p> <p>b) Use of the following antibiotics is prohibited: Avoparcin, Chloramphenicol, Fluoroquinolones, Polymyxins, Furazolidone, 4th generation Cephalosporins, or any other antibiotic not registered for use in the country where the animals are raised.</p> <p>c) Highest priority critically important antibiotics not explicitly prohibited under 5.11.b shall be administered only for systemic (by injection) treatment of individual cattle with a diagnosed disease after culture and susceptibility testing show no other antibiotic will work.</p> <p>d) The following additional substances are prohibited for use in beef cattle and bison production:</p> <ol style="list-style-type: none"> <li>1) Organochlorinated substances;</li> <li>2) Anabolics, including beta-agonists (used to promote muscle mass increase);</li> <li>3) Hormones (used to stimulate higher production or growth promotion);</li> <li>4) Clenbuterol, Diethylstilbestrol (DES), Dimetridazole, glycopeptide, Ipronidazole.</li> </ol>

<p><b>5.12</b> Infrastructure is clean and safe for cattle, working animals and people.</p> <ul style="list-style-type: none"> <li>• Where shelters or housing are provided, facilities are clean and dry, and animals have sufficient and clean bedding, natural light and ventilation, and protection from climate conditions and events.</li> <li>• Feed storage protects the quality of feed and prevents environmental impacts from storage areas.</li> <li>• Manure collection and storage is separate from animal shelters and feed storage areas.</li> </ul>	<ul style="list-style-type: none"> <li>a) Chutes, alleys, and other restraining equipment and facilities are designed and maintained to reduce stress and injury. Hydraulic restraint systems are adjusted according to manufacturers' instructions to prevent excessive pressure during restraint.</li> <li>b) Operations Plan includes a regular schedule for cleaning and maintenance of all working parts. Recordkeeping documents maintenance.</li> <li>c) Facilities are checked regularly to maintain safe and healthy living conditions.</li> <li>d) Supplemental feed storage: <ul style="list-style-type: none"> <li>1) Preserves feed quality;</li> <li>2) Prevents animal access or contamination by birds and vermin;</li> <li>3) Prevents clean runoff from entering or leaving the storage site;</li> <li>4) Maintains optimum freshness, palatability and nutritional value of feed;</li> <li>5) Is never subject to flooding, or if flooding occurs, storage is designed to prevent contamination of water resources in the event of flooding.</li> </ul> </li> </ul>
<p><b>5.13</b> Animal transport procedures ensure animal safety and wellbeing, while minimizing stress. Adverse impacts of cattle transportation on the environment are minimized.</p>	<ul style="list-style-type: none"> <li>a) Animals are declared fit by trained personnel before any travel.</li> <li>b) Except for emergencies and medical treatment, animals with the following conditions are not transported: <ul style="list-style-type: none"> <li>1) Sick or severely injured animals, including those with open surgical wounds;</li> <li>2) Females that have given birth less than 48 hours ago;</li> <li>3) Cows in the last month of pregnancy.</li> </ul> </li> <li>c) Calves must be weaned and vaccinated at least 45 days prior to off-farm/ranch transport to confinement.</li> <li>d) Loading and unloading activities minimize stress.</li> <li>e) Vehicles transport cattle safely: <ul style="list-style-type: none"> <li>1) Vehicles and loading equipment are in good repair and prevent injury to animals, reduce stress caused by overcrowding or undercrowding, wind chill or overheating;</li> <li>2) Animals are not contained in the vehicle for more than 24 hours continuously;</li> <li>3) Where animals are to be transported for more than 24 hours, carrier must unload the livestock for rest, feed and water for at least 5 hours at a location that has all the facilities necessary for loading, unloading, resting, feeding, watering and inspecting the livestock.</li> </ul> </li> <li>f) Written records are maintained for animal transportation to slaughter facilities, including dates, numbers of animals transported, and conditions.</li> </ul>

## Principle 6: Climate Smart Ranching and Farming and Reduction of Operation’s Carbon Footprint

*Beef operations progressively reduce and minimize net greenhouse gas emissions, carbon footprint, and emissions of other priority air pollutants.*

*“Ultimately, agriculture that is better adapted to climate variability and change, has a lower environmental footprint and GHG emissions intensity, and supports economic and societal aspirations of farmers, will generate greater and more reliable returns along the entire value chain, and help to ensure food security around the world.” – Global Research Alliance on Agricultural Greenhouse Gases and SAI Platform<sup>27</sup>*

*“Practices and policies that encourage maintaining and improving soil carbon sequestration are consistently associated with improved soil and water quality; reductions in silt loads and sediments into streams, lakes and rivers; and improvements in air quality.” – Lal and colleagues<sup>28</sup>*

**Objectives and outcomes of Principle 6:** This Principle documents that the operation has optimized grazing, herd, land, and nutrient management to reduce and minimize the carbon footprint of the operation – net emissions of greenhouse gases (GHGs). Well-managed grazing and other management activities continuously reduce and minimize emissions of carbon dioxide (CO<sub>2</sub>), nitrous oxide, and methane, and increase carbon sequestration to the soil’s potential. In addition, operations optimize feed and breed selection to reduce and minimize emissions of methane (both enteric methane emitted from cattle rumen and manure methane) and nitrous oxide (emitted from manure and nutrient management). Operations avoid or minimize conversion of natural ecosystems to croplands and other intensive uses, restore degraded lands and croplands to perennial pasture, and utilize conservation tillage or no-till practices (where applicable). The result is to reduce net CO<sub>2</sub> emissions by preventing emissions associated with land conversion and by increasing the acreage of the operation that is managed to optimize carbon sequestration. Well-managed nutrient application and manure storage progressively reduces and minimizes emissions of methane and nitrous oxide. Ranches and farms have achieved additional minor emissions reductions – and realized associated cost savings – by increasing and maximizing energy efficiency, fuel efficiency, and use and generation of renewable energy, and by reducing and minimizing use of petroleum-based energy sources, fertilizers and pesticides. Since climate smart ranching strategies focus primarily on improving production efficiencies, management quality, and resilience to drought and other forms of extreme weather-related events, they offer economic opportunities to producers and help mitigate risks.

Criteria	Indicators
6.1 A <u>Climate Smart</u> Ranching Plan is developed and implemented as part of the Resource Management Plan. The Climate Smart Ranching Plan identifies issues of concern related to emissions of <u>GHGs</u> and	The plan considers the following sources of emissions and emissions reduction opportunities, as applicable to the operation: a) Carbon Dioxide (CO <sub>2</sub> ): 1) Restore soil carbon pools on degraded lands and maintain existing soil carbon pools on healthy lands;

<p>other air pollutants identified as issues of concern, and documents implementation and monitoring of corrective actions.</p> <p><i>Critical Criterion CC+3</i></p>	<ol style="list-style-type: none"> <li>2) Prevent land conversion, including <u>sod-busting</u> and <u>swamp-busting</u>;</li> <li>3) Increase and maximize fuel efficiency of transport vehicles and farm equipment;</li> <li>4) Increase and maximize energy efficiency and maximize use of renewable energy;</li> <li>5) Reduce and minimize GHG emissions associated with production and application of inputs.</li> </ol> <p>b) Methane (CH<sub>4</sub>; enteric and manure):</p> <ol style="list-style-type: none"> <li>1) Manage grazing to optimize forage quality and digestibility;</li> <li>2) Select feed(s) to achieve emission reductions;</li> <li>3) Select animal breed(s) to achieve emission reductions; and</li> <li>4) Manage manure to reduce and minimize emissions, where applicable.</li> </ol> <p>c) Nitrous Oxide (N<sub>2</sub>O):</p> <ol style="list-style-type: none"> <li>1) Manage grazing to prevent the formation of N hot spots by optimizing the spatial distribution of deposited nutrients;</li> <li>2) Select feed to achieve emission reductions;</li> <li>3) Manage nutrients and manure to reduce and minimize emissions, where applicable.</li> </ol>
<p><b>6.2</b> Grazing and pasture management <u>optimize carbon sequestration</u>, and reduce and minimize emissions of <u>enteric and manure methane</u>, nitrous oxide, carbon dioxide, and dust/particulates.</p>	<p>a) Grazing and pasture management is designed to (to potential given currently available technologies and practices, local climate and soils, and the scope of the operation):</p> <ol style="list-style-type: none"> <li>1) Optimize soil carbon sequestration;</li> <li>2) Reduce and minimize soil carbon losses;</li> <li>3) Reduce and minimize lifecycle enteric methane emissions to current potential; and</li> <li>4) Reduce and minimize nitrous oxide emissions.</li> </ol>
<p><b>6.3</b> Feed selection and production reduces and minimizes greenhouse gas emissions, including enteric and manure methane, nitrous oxide, and carbon dioxide.</p>	<p>a) Feed and forage are selected and produced to reduce GHG emissions, including by (as relevant to the scope of the operation):</p> <ol style="list-style-type: none"> <li>1) optimizing forage and feed quality and digestibility;</li> <li>2) optimizing use of legumes as forage, feed and/or cover crops;</li> <li>3) utilizing feed additives and supplements that reduce enteric methane emissions, where applicable to the production system;</li> <li>4) choosing crops and production systems documented to generate low or progressively decreasing GHG emissions (i.e., low GHG footprint feeds).</li> </ol>
<p><b>6.4</b> Choice of animal breeds and breeding practices contributes to reductions in <u>lifecycle enteric methane emissions</u>.</p>	<p>a) The operation’s herd development and breeding program considers the capacity of cattle to adapt to the local climate and geography, resistance to parasites and diseases, and feed efficiency in a manner that enables them to reach sale/slaughter weight as quickly as possible given local conditions.</p>
<p><b>6.5</b> <u>Land conversion</u> and/or <u>restoration</u> activities reduce and minimize net GHG emissions.</p>	<p>a) Adverse impacts of land conversion and/or benefits of restoration activities are documented, with outcomes yielding positive or improving influences on net GHG emissions.</p>

See also 2.7 Land Conversion	
<b>6.6</b> <u>Soil carbon/organic matter</u> is at or increasing towards locally appropriate levels.	<ul style="list-style-type: none"> <li>a) Records demonstrate that levels of soil carbon/organic matter are appropriate to or increasing towards the sequestration potential of local soils, taking into account recent climate conditions.</li> <li>b) Where identified as an issue of concern, corrective actions are in place to optimize soil carbon/organic matter levels.</li> </ul>
<b>6.7</b> GHGs and other air pollutant emissions identified as issues of concern from management activities related to manure and commercial fertilizers and other on-farm waste are reduced and minimized.	<ul style="list-style-type: none"> <li>a) Management of pastures, crop fields and high-use areas (e.g., corrals, backgrounding lots, wintering facilities) reduces and minimizes nitrous oxide and methane emissions from animal manure and synthetic fertilizer.</li> <li>b) Where additional air pollutants are identified as an issue of concern related to manure management (e.g., VOC's, ammonia, pathogens), strategies are in place to reduce and minimize these emissions.</li> <li>c) Plastic trash or other items that emit toxins when burnt are recycled or taken to the transfer station.</li> </ul>
<b>6.8</b> GHG emissions from <u>fossil fuel</u> use are reduced by increasing energy and fuel efficiencies and use of <u>renewable energy</u> .	<ul style="list-style-type: none"> <li>a) The beef operation can provide documentation that (to potential given currently available technologies): <ul style="list-style-type: none"> <li>1) Fuel efficiency and use of low-carbon fuels for transport and farm equipment is improving and maximized;</li> <li>2) Energy and fuel efficiency of planting, tillage, and input application is increasing and maximized;</li> <li>3) Electricity and heating energy efficiency and use of renewable energy are increased and maximized;</li> <li>4) The GHG intensity of applied inputs is reduced and minimized.</li> </ul> </li> </ul>
<b>6.9</b> Proactive adaptations to climate change found in the Contingency Plan are implemented to increase the resilience of the operation's resource base, and monitored to ensure effectiveness.	See 1.2.2 - Contingency Plan

## END NOTES – GRASSLANDS ALLIANCE STANDARD

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- <sup>1</sup> H.H. Janzen (2011)
- <sup>2</sup> GLCI 2010
- <sup>3</sup> Bestelmeyer et al. 2011; Briske et al. 2011a; Teague et al. 2009; SRR 2008; Gelbard 2003; Noss and Cooperrider 1994
- <sup>4</sup> Work et al. 2009
- <sup>5</sup> Tanaka and colleagues (2011)
- <sup>6</sup> Derner et al. 2009; Work et al. 2009
- <sup>7</sup> Work et al 2009
- <sup>8</sup> FSC 2010
- <sup>9</sup> This section adopted from the 2013 GRASS standard developed by The Nature Conservancy, Ovis XXI and Patagonia, Inc.
- <sup>10</sup> Franzluebbbers et al. (2012)
- <sup>11</sup> Baskin 1998, Mack et al. 2000; Mooney and Hobbs 2000, Gelbard 2003
- <sup>12</sup> Joyce et al. 2013; Shaw et al. 2011; Gelbard 2003
- <sup>13</sup> Examples of such programs include the National Invasive Species Council, the various State Invasive Plant Councils, relevant Agricultural Departments and plant management societies, and local Early Detection Networks.
- <sup>14</sup> Matt Sanderson, USDA ARS, Personal Communication
- <sup>15</sup> Franzluebbbers et al. (2012)
- <sup>16</sup> Janzen (2014)
- <sup>17</sup> Stillings et al. (2003)
- <sup>18</sup> Grazing Lands Conservation Initiative (2010)
- <sup>19</sup> SRR 2010
- <sup>20</sup> Baskin 1998, Mack et al. 2000; Mooney and Hobbs 2000, Gelbard 2003
- <sup>21</sup> NRC 2010
- <sup>22</sup> Gurian-Sherman 2008
- <sup>23</sup> This damage will occur even with quiet animals if a predator (bear, cougar, etc) gets near the herd when they are in the facilities and the animals panic and try to escape, or if two aggressive animals are penned next to each other. Inspector MUST give allowance for these extreme behaviors that are not under the manager's control.
- <sup>24</sup> A "covered" pen may not be a reasonable facility in some types of weather conditions. Cover may increase discomfort by isolating animals in the dark.
- <sup>25</sup> A rough coat/poor grooming dull eyes, lethargy/sluggish movement, poor appetite, over-stretching of the neck, hunching the back, kicking the belly area (indicating abdominal pain), grinding teeth, star-gazing are indicators of poor health.
- <sup>26</sup> Vitamin supplements, per se, are usually not appropriate for ruminants. Some vitamins may be included in a trace mineral mixture rather than provided independently, but this practice depends on geography and other nutritional factors.
- <sup>27</sup> Andeweg and Reisinger 2014
- <sup>28</sup> Lal et al. (2003)

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