NEVADA HAYLAND CONDITION SCORING GUIDE

SOIL ATTRIBUTES

INDICATOR	1	2	3	4	5
SOIL STRUCTURE	Soil surface is extremely hard, with a thick crust; tillage creates large clods that do not break apart. *or* Dry soil falls apart in hands and is excessively powdery.	Soil surface is hard, with a thick crust; tillage creates large clods that do not easily break apart. *or* Dry soil falls apart in hands and is powdery.	Surface soil has moderate porosity, some crusting, small tillage clods, soil breaks apart with moderate pressure. *or* Soil crumbles in hand, few soil aggregates.	Surface soil is porous, some light crusting may occur, tillage clods are small, soil breaks apart with light pressure. *or* Soil crumbles in hand, soil aggregates are common.	Soil crumbles well, is friable and porous. Soil surface has many small aggregates which crumble easily.
SOIL ORGANIC MATTER	No visible roots or plant residue in upper soil. Topsoil same color as subsoil. Earthworms absent, even in moist soil.	Few visible roots or plant residue in upper soil. Topsoil same color as subsoil. Few earthworms even in moist soil. No worm casts or holes.	Some visible, non-decomposed residue. Few roots. Topsoil about same color as subsoil. Moderately few earthworms even in moist soil. Few worm casts or holes.	Non-decomposed residue and crop roots are visible and common. Topsoil darker color than subsoil but color boundary is not distinct. Earthworms abundant in moist soil. Worm casts or holes obvious and common.	Many roots and abundant plant residue in differing stages of decomposition. Topsoil clearly defined and much darker color than subsoil. Earthworms abundant in soil. Worm casts or holes are obvious and extensive.
SOIL COMPACTION	Infiltration capacity and surface runoff severely affected by compaction extending to soil surface. Very hard to push a soil probe into soil without damage to probe. Crop plants have shallow or stunted roots; roots are flattened and oriented horizontally rather than vertically in soil.	Infiltration capacity reduced due to dense compaction layer near the surface. Hard to push a soil probe through soil layers. Obvious "plow pan".	Infiltration capacity lowered and surface runoff increased due to soil compaction. Soil resistant to soil probe entry at one or more depths within zone of tillage. Deep tillage (chisel, sub-soiler) performed periodically to fracture restrictive soil layers and maintain optimal rooting depth.	Infiltration capacity somewhat lowered due to soil compaction by equipment traffic. Root penetration slightly restricted and probe enters soil with moderate ease. Deep tillage (chisel, sub-soiler) performed periodically to fracture restrictive soil layers and maintain optimal rooting depth. Forage harvest operations performed with minimum equipment traffic and avoidance of repeated travel patterns.	Soil is loose, root penetration is unrestricted, no "plow pan" evident, mostly vertical plant root growth. Probe easily enters soil through all layers within and below plow zone. Deep tillage (chisel, sub-soiler) performed periodically to fracture restrictive soil layers and maintain optimal rooting depth. Forage harvest operations performed with minimum equipment traffic and avoidance of repeated travel patterns.
DRAINAGE	Soils of field stay wet for exceptionally long periods, greatly delaying or even preventing some field operations. Ponding prevents crop growth over more than 20% of field. More water evaporates than drains, field always very wet.	Soils of field stay wet for long periods, field operations usually have to be delayed. Ponding prevents crop growth over 10 to 20% of field. Water lays at surface for a long period of time but eventually drains.	Soil wetness restricts timely equipment work but field can eventually be farmed. Ponding prevents crop growth over less than 10% of field. Soils drain and warm only slowly in spring, soil is water-logged after heavy rainfall or irrigation. Water lays at surface for a short period before draining.	Wet spots delay timely equipment work but entire field can eventually be farmed. Ponding may limit, but does not prevent, crop growth. Soils drain and warm somewhat slowly in spring.	Entire field can be worked on same day. Soils drain and warm quickly in spring, only limited delays, if any, in field operations, good balance between air and water in the soil. No ponding, no runoff, water moves freely through soil steadily, soil not too wet, not too dry.
SALT ACCUMULATION	Electrical conductivity (EC) of solution extracted from saturated soil is ≥16. Surface crust of salt crystals visible over more than 20% of field.	Electrical conductivity (EC) of solution extracted from saturated soil is <16 and ≥8. Discontinuous, or "spotty", surface crust of salts visible over 10 to 20% of field.	Electrical conductivity (EC) of solution extracted from saturated soil is <8 and ≥4. Discontinuous, or "spotty", surface crust of salts visible over less 10% of field.	Electrical conductivity (EC) is of solution extracted from saturated soil <4 and ≥2. or Salts do not exceed desirable or seeded forage plant tolerances and are below toxic levels for plants and animals fed harvested forages.	Electrical conductivity (EC) of solution extracted from saturated soil is <2. No salt accumulation on soil surface.

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CROP ATTRIBUTES

INDICATOR	1	2	3	4	5
UNIFORMITY OF GROWTH	Perennial forage crop plants show great variability in height and stage of development. Forage crop plant density is <35% of an average perennial hayland stand of similar type hay crops harvested within the Common Resource Area (CRA).	Perennial forage crop plants show great variability in height. Forage crop plant density is 35 to 70% of an average stand of similar type hay crops harvested within the Common Resource Area (CRA).	Perennial forage crop plants somewhat stunted and/or wilted. Uneven perennial forage crop stand height. Forage crop plant density is >70 to <90% of that expected for an average stand of similar type hay crops harvested within the Common Resource Area (CRA).	Relatively uniform height of the perennial forage crop across field. Some "spottiness" evident where crop is stunted. Forage crop plant density is 90% to <100% of that expected for an average stand of similar type hay crops harvested within the Common Resource Area (CRA).	Perennial forage crop plants produce a uniform stand with normal growth across the entire field. Forage crop plant density is ≥100% of an average stand of similar type hay crops harvested within the Common Resource Area (CRA).
PLANT VIGOR	Forage crop plants severely stunted, spindly, yellow-colored, and/or wilted. Dead crop plants common.	Forage crop plants severely stunted, spindly, chlorotic, and/or wilted. Some dead crop plants.	Forage crop plants somewhat stunted, spindly, plants medium green-colored, and/or wilted. Some dead or dying plants.	Forage crop plants show some sign of short-term stress (*i.e.,* slightly curled leaf margins).	Forage crop plants show no visible evidence of stress. Vigorous growth with healthy, dark-green, crop color.
PERCENT DESIRABLE PLANTS	Hay crop stand comprised of less than 35% (by air-dry weight) seeded and/or desirable perennial forage species.	Hay crop stand comprised of more than 35% and ≤70% (by air-dry weight) seeded and/or desirable perennial forage species.	Hay crop stand comprised of more than 70% and ≤95% (by air-dry weight) seeded and/or desirable perennial forage species.	Hay crop stand comprised of at least 95% (by air-dry weight) seeded and/or desirable perennial forage species.	Hay crop stand comprised of ≥95% (by air-dry weight) seeded forage species.
CROP YIELD	Crop yield is <50% of the 5-year county average [or 5-year average yield within the Common Resource Area (CRA)].	Crop yield is 50 to 75% of the 5-year county average [or 5-year average yield within the Common Resource Area (CRA)].	Crop yield is 75 to 90% of the 5-year county average [or 5-year average yield within the Common Resource Area (CRA)].	Crop yield is 90 to 100% of the 5-year county average [or 5-year average yield within the Common Resource Area (CRA)].	Crop yield is greater than the 5-year county average [or 5-year average yield within the Common Resource Area (CRA)].

CROP PESTS

INSECTS AND/OR DISEASE	Severe insect or disease infestation with high crop mortality. Insect or disease outbreaks exceed economic threshold levels. No beneficial insects observed in field.	Crops show moderate signs of insect or disease infestation. Many plants have significant leaf, stem, and/or root damage. Insect or disease outbreak at economic threshold and immediate treatment needed. No beneficial insects observed in field.	Crops show signs of insect or disease infestation. Some leaf, stem, and/or root damage is observable on many plants. Insect or disease outbreak nearing economic threshold. Few beneficial insects observed in field.	Some insect and/or disease present, but little impact on crop production. Some leaf, stem, and/or root damage is observable but limited to small, isolated, areas. Insect and/or disease levels are at economic threshold levels. Beneficial insects observed in field. Rotational cropping system discourages persistence of specific problem pests.	No observable evidence of insect or disease damage to crops; insect and/or disease levels in field, if present, are well below economic threshold levels. Beneficial insects abundant in field. Crops selected in rotation do not serve as host plant for problem pests; cultivars used have genetic resistance to problem pests; or cultivars selected have crop maturity dates prior to development of pest populations.
WEEDS *(Excluding weeds in field borders, fence rows, etc.)*	Weeds occupy more than 50% of canopy cover in planted crop field. Crop growth severely restricted due to weed competition. Noxious weeds may be present.	Weeds occupy 20 to 50% of canopy cover in planted crop field. Crop moderately stressed due to weed competition. If noxious weeds present, move rating one category to left	Weeds occupy 10 to <20% of canopy cover in planted crop field. Crop shows signs of stress due to weed competition. If noxious weeds present, move rating one category to left.	Weeds occupy 5 to 10% canopy cover in planted crop field. Crop shows no observable signs of stress due to weed competition. Noxious weeds not present.	Weeds occupy less than 5% of canopy cover in planted crop field. Crop shows no sign of stress due to weed competition. Noxious weeds not present. Rotational crops discourage persistence of specific problem weeds.

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MANAGEMENT ATTRIBUTES

INDICATOR	1	2	3	4	5
IRRIGATION	Crop failure or major crop plant loss due to severe "under-irrigation"; or,. major forage crop loss due to submergence of plants, "over-irrigation".	Wilted plants due to moderately-severe "under-irrigation" with little recovery; or, some stand loss due to submergence with "over-irrigation". Very uneven forage crop stand.	Wilted plants due to moderate "under-irrigation" evident only during mid-day heat; or plants weakened from short-term submergence with "over-irrigation". IWM plan developed for hayland management unit; Relatively uneven crop stand.	Irrigation scheduling or application rates present less than optimum soil moisture conditions for crop, but no plant wilting or weakened plants evident. IWM plan developed and plan is followed in most years; Uniform crop stand.	Crop properly irrigated. Irrigation scheduling and application rates meet forage crop requirements. IWM plan developed and fully implemented for hayland treatment unit; Uniform crop stand.
PLANT NUTRIENTS	Evidence of severe nutrient deficiency on more than 35% of field – soil fertility test needed to confirm this initial diagnosis. or Over application of animal waste or fertilizers exceeds soil capacity to retain nutrients - soil fertility test and nutrient analysis needed to confirm. or Significant crop reductions on more than 35% of the field.	Evidence of severe nutrient deficiency on more than 25% of field – soil fertility test needed to confirm this initial diagnosis. or Over application of animal waste or fertilizers exceeds soil capacity to retain nutrients - soil fertility test needed to confirm. or Significant crop reductions on less than 35% and ≥ 25% of the field.	Evidence of one or more nutrient deficiencies on 5 to 25% of field – soil fertility test needed to confirm this initial diagnosis. or Application of animal waste or fertilizers occasionally exceeds soil capacity to retain nutrients - soil fertility test and nutrient analysis needed. or Measurable crop reduction on less than 25% of the field.	Evidence of nutrient deficiencies/excesses on less than 5% of field – soil fertility test needed to confirm this initial diagnosis. Measurable crop reduction, if any, on less than 10% of the field. Nutrient Management Plan developed for hayland field. Rotational cropping system applied.	No evidence of nutrient deficiencies – soil fertility tests periodically performed. Nutrient Management Plan developed and conscientiously followed. Rotational cropping system applied with crop selection made considering different crop nutrient needs; differing ability of crops to modify soil fertility levels; and, crop differences in nutrient extraction depth (rooting depth).
ROTATION CROP RESIDUES	Residues left following aftermath grazing or machine harvest of rotation crops cover less than 5% of field; amount of residues insufficient to prevent soil erosion during the critical erosion period.	Residues left following aftermath grazing or machine harvest of rotation crops cover ≥5% and <10% of field; amount of residues insufficient to prevent soil erosion during the critical erosion period.	Residues left following aftermath grazing or machine harvest of rotation crops cover less than ≥10% and <20% of field; amount of residues insufficient to prevent soil erosion during the critical erosion period.	Residues left following aftermath grazing or machine harvest of rotation crops cover ≥20% of field; amount of residue type insufficient to prevent soil erosion during the critical erosion period.	Residues following aftermath grazing or machine harvest of rotation crops well distributed and sufficient to prevent soil erosion during the critical erosion period. *or* No rotation crops planted - continuous perennial hay crop production.
LIVESTOCK TRAILING AND CONCENTRATION AREAS	Livestock concentration areas and trails cover >5% of the hayland field; or concentration areas allow for contaminated runoff to be conveyed directly into adjacent water bodies.	Livestock concentration areas and trails cover 2 to 5% of the hayland field;	Isolated livestock concentration areas and trailing evident (<2% of hayland field).	Some livestock trailing evident with no observable areas of livestock concentration.	Absence of livestock concentration areas and no evidence of livestock trailing. *or* No livestock grazing of hayland.
SEVERITY OF GRAZING USE	Stubble height following grazing of perennial hay crop aftermath averages less than 1 inch across the field. Stubble height following aftermath grazing not adequate to prevent soil erosion during the critical erosion period.	Stubble height following grazing of perennial hay crop aftermath averages less than 2 inches across the field. Stubble height following aftermath grazing not adequate to prevent soil erosion during the critical erosion period.	Stubble height following aftermath grazing of perennial hay crop less than adequate for maintenance of crop vigor. Livestock routinely allowed to graze on hayland after initiation of crop growth in the spring.	Stubble height following grazing of perennial hay crop aftermath is adequate for maintenance of crop vigor; A Prescribed Grazing plan developed for the hayland management unit is followed in most years.	No livestock grazing of hayland; *or* Stubble height following harvest of perennial hay crop adequate to maintain forage plant vigor; *and* A Prescribed Grazing plan has been developed for the entire operating unit and is fully and continuously implemented.

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SOIL EROSION

INDICATOR	1	2	3	4	5
IRRIGATION INDUCED EROSION *Surface*	*Irrigation Induced* Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining final Hayland Condition Score		Active soil movement limited to areas adjacent to irrigation system components (*i.e.*, turnouts and at end of runs). Irrigation tailwater or runoff from established stands with little visible sediment load. Some plant litter collects at bottom of field. 0.5- to <1-inch of sediment deposition for areas within field, along borders, road ditches, or culverts.	Significant soil movement with active erosion at turnouts from water conveyances. Irrigation tailwater off established stands has visible sediment load. Large-sized debris accumulates at bottom of field. 1- to 2-inches of sediment deposition for areas within field, along borders, road ditches, or culverts.	Crop roots visible on surface. Head ditches significantly higher than field. Flow channels and rills cannot be obliterated by ordinary tillage. Reshaping of field needed for continued production. Irrigation tailwater/runoff with highly visible sediment load. More than 2-inches of sediment deposition for areas within field, along borders, road ditches, or culverts.
IRRIGATION INDUCED EROSION *Sprinkler*	*Irrigation Induced* Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining final Hayland Condition Score		Minor rill and inter-rill erosion due to sprinkler irrigation. Flow channels and rills can be easily removed by ordinary tillage (light harrowing). 0.5- to <1-inch of sediment deposition for areas within field, along road, ditches, or culverts.	Significant rill and inter-rill erosion due to sprinkler irrigation is common. Active erosion near sprinkler heads or wheel tracks. Flow channels and rills can be removed by ordinary tillage (disking). 1- to 2-inches of sediment deposition for areas within field, along road, ditches, or culverts.	Deep *U*- or *V*-shaped channels evident throughout field. Flow channels cannot be obliterated by ordinary tillage. Reshaping of field needed for continued production. More than 2-inches of sediment deposition on areas within field, along road, ditches, or culverts.
WATER EROSION *Sheet and Rill* *Due to Rainfall/Snow Melt Not irrigation Induced* *(Qualitative Assessment)*	*Sheet and Rill* Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining final Hayland Condition Score		Plant and rock pedestals (due to erosion) occupy 10 to 20% of soil surface in field; ***or*** rills average less than 1-inch deep. Flow channels and rills can be easily removed by ordinary tillage.	Plant and rock pedestals (due to erosion) occupy 20 to 50% of soil surface in field; ***or*** well defined rills 1 to 3" deep are present and spaced at close intervals. Flow channels and rills can be removed by ordinary tillage.	Sheet and rill erosion is active throughout field. Rills spaced at close intervals and are 3 to 8" deep; ***or*** one or more concentrated flow channels >8" deep (gullies) in field; ***or*** rock pedestals (due to erosion) occupy >50% of soil surface in field.
WATER EROSION *(Quantitative, or Calculated, Assessment)*	*Sheet and Rill* Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining Hayland Condition Score		Water erosion estimate for full hayland rotation cycle using appropriate erosion prediction technology (RUSLE2) is ≥1 ton/ac and ≤3 ton/ac.	Water erosion estimate for full hayland rotation cycle using appropriate erosion prediction technology (RUSLE2) is >3 tons and ≤5 tons.	Water erosion estimate for full hayland rotation cycle using appropriate erosion prediction technology (RUSLE2) is >5 tons.
WIND EROSION *(Qualitative Assessment)*	Wind Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining final Hayland Condition Score		Some vegetative debris is windrowed; minor wind damage to plant foliage. Small amounts of soil deposition evident on lee side of obstructions, in depressions, and at undisturbed field edge.	Plants show evidence of leaf shredding due to wind damage; some root exposure. Wind blown deposits around obstructions and on the lee side of depressions, culverts, etc.	Smooth, wind-blown (rippled appearance), soil surface. Obvious root exposure of forage crop plants. Substantial build up of soil deposits. Significant crop loss from wind erosion (abrasion or clipping) in part or all of field.
WIND EROSION *(Quantitative, or Calculated, Assessment)*	Wind Erosion indicator ratings are "Negative Values" (*i.e.*,–3, –4, and, –5) and are subtracted from tally of other (non-negative value) indicators in determining final Hayland Condition Score		Wind erosion estimate for full hayland rotation period using appropriate erosion prediction technology (WEQ, WEPS) is ≥1 ton/ac and ≤3 ton/ac.	Wind erosion estimate for full hayland rotation period using appropriate erosion prediction technology (WEQ, WEPS) is >3 tons and ≤5 tons.	Wind erosion estimate for full hayland rotation period using appropriate erosion prediction technology (WEQ, WEPS) is >5 tons.