Hawaii Quality Criteria Table					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Erosion – Sheet and Rill	Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.	Same as National: Sheet and rill erosion does not exceed the Soil Loss Tolerance "T".	• RUSLE2: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm • Visual assessment (presence of pedestals, rills, and exposed subsoil colors) • Client interview	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	RUSLE2: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm
Soil Erosion – Wind	Detachment and transport of soil particles caused by wind degrade soil quality and/or damage plants.	Same as National: Wind erosion does not exceed the Soil Loss Tolerance "T" or, for plant damage, does not exceed Crop Damage Tolerances.	• WEQ; for plant damage do not exceed values in 190-V-National Agronomy Manual, 3rd Ed. Oct 2002; Table 502-4: http://policy.nrcs.usda.gov/scripts/lpsiis.dll/M/M_190_NAM.pdf • Visual assessment (presence of pedestals and blown-out areas) • Client interview	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	WEQ, critical period method
Soil Erosion – Ephemeral Gully	Small channels caused by surface water runoff degrade soil quality and tend to increase in size. On cropland, they can be obscured by heavy tillage.	Same as National: Surface water runoff is controlled sufficiently to stabilize the small channels and prevent reoccurrence of new channels.	• Visual assessment • Client interview • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/
Soil Erosion-Classic Gully	Deep, permanent channels caused by the convergence of surface runoff degrade soil quality. They enlarge progressively by head cutting and lateral widening.	Same as National: Surface water runoff is controlled sufficiently to stop progression of head cutting and widening.	• Visual assessment • Client interview • Area measurement and volume calculation • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/ • Aerial photo trend analysis	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/

Hawaii Quality Criteria Table					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Erosion – Streambank	Accelerated loss of streambank soils restricts land and water use and management.	Same as National: Accelerated streambank soil loss does not exceed a level commensurate with upstream land use and normal geomorphologic processes on site.	• Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must achieve: • . Bank stability >=1.5 and 8. Riparian condition >=1.0 • Visual assessment (condition of streambank and sediment in water) • Aerial photo trend analysis and geologic condition • Client interview • Area measurement and volume calculation • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/
Soil Erosion – Shoreline	Soil is eroded along shorelines by wind and wave action, causing physical damage to vegetation, limiting land use, or creating a safety hazard.	Same as National: Shoreline erosion is stabilized to a level that does not restrict the use or management of adjacent land, water or structures.	• Visual assessment (wave cut escarpment and sediment in water) • Client interview • Aerial photo trend analysis • Area measurement and volume calculation • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/
Soil Erosion – Irrigation induced	Improper irrigation water application and equipment operation are causing soil erosion that degrades soil quality.	Same as National: Irrigation induced erosion does not exceed the Soil Loss Tolerance "T".	• Visual assessment (for sprinkler and drip irrigation systems: assess if any rills present can be attributed to the system and/or management.) • Area measurement and volume calculation • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/	Tons/Acre/Year – average annual tons of erosion reduced per acre for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/

Hawaii Quality Criteria Table					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Erosion – Mass Movement	Soil slippage, landslides, or slope failures, normally on hillsides, result in large volumes of soil and rock movement.	Same as National Shallow slumps, slides, or slips are prevented or minimized so that the mass movement of earth material does not exceed naturally occurring rates.	• Visual assessment • Client interview • Aerial photo trend analysis • Area measurement and volume calculation Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/
Soil Erosion – Road, Roadsides and Construction Sites	Soil loss occurs on areas left unprotected during or after road building and/or construction activities.	Same as National: Sites are adequately protected from soil loss during and after road building and construction activities.	• Visual assessment (soil loss-rills, gullies, slumps, slides, slips, sediment deposition down slope) • Area measurement and volume calculation • Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/ • Client interview • RUSLE2: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm	Tons/Year – average annual tons of erosion reduced for the field or planning area/unit	Ephemeral Gully (EG) Worksheet: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_8_eg_worksheet/

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Organic Matter Depletion	Soil organic matter has lowered or will diminish to a level that degrades soil quality.	Same as National: Soil Conditioning Index is positive. (non-zero or +).	• Soil Conditioning Index (SCI), RUSLE2: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm	Soil Conditioning Index improvement – positive improvement in index for the field or planning area/unit	Soil Conditioning Index (SCI), RUSLE2: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm
Soil Condition – Rangeland Site Stability	The capacity to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.	Same as National: Indicators of Rangeland Health Attribute rating for Soil/Site Stability show Slight to Moderate or less departure from Ecological Reference Sheet (ESD).	• Ecological Reference Sheet	Departure from Ecological Reference Sheet (ESD) categories – amount of departure, by numeric value, from Ecological Reference Sheet for the field or planning area/unit. 1=None to Slight, 2=Slight to Moderate, 3=Moderate, 4=Moderate to Extreme, or 5=Extreme.	Ecological Reference Sheet
Soil Condition – Compaction	Compressed soil particles and aggregates caused by mechanical compaction adversely affect plant-soil-moisture relationships.	Same as National: Mechanically compacted soils are renovated sufficiently to restore plant root growth and/or water movement.	• Physical test (12-14 gage high tensile wire penetrates below moist root zone, usually to 12 inches) • Penetrometer • Visual assessment (prevalence of plant root systems in subsurface layer) • Soil Quality Checklist, Section IV Subsurface Layer Assessment: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_4_checklist_and_intro/ • Soil Quality Test Kit bulk density test: http://soils.usda.gov/sqi/soil_quality/assessment/kit2.html	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Subsidence *(Not a resource concern in Hawaii.)*	Loss of volume and depth of organic soils due to oxidation caused by above-normal microbial activity resulting from excessive drainage or extended drought.	National Quality Criteria: The timing and regime of soil moisture is managed to attain acceptable subsidence rates.	Not applicable	Inches/Acre/ Year – average annual inches of subsidence reduced per acre for the field or planning area/unit	Not applicable
Soil Condition – Organic Soil Volatilization *(Added Hawaii resource concern.)*	*Loss of volume and depth of organic soils due to oxidation caused by above-normal microbial activity resulting from forest clearing, fertilization and increased aeration.*	*90% or better herbaceous or mulch cover in inter-rows.*	• *Visual assessment* • *Transects* • *Soil test*	*Non measurable*	*Non measurable*
Soil Condition – Contaminants: Salts and Other Chemicals	Inorganic chemical elements and compounds such as salts, selenium, boron, and heavy metals restrict the desired use of the soil or exceed the soil buffering capacity.	Same as National: Salinity levels cause less than a 10% decrease in plant yield. Other contaminants do not exceed plant tolerances or are below toxic levels for plants or animals.	• UH Agricultural Diagnostic Service Center (ADSC) soil test for EC, pH, and acidity: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Effect of soil salinity on growth of crops per Agricultural Waste Management Field Handbook—Chapter 6, Figures 6-2, 3, and 4: http://www.info.usda.gov/CED/ftp/CED/neh651-ch6.pdf • CTAHR publications on salt tolerant plants • Soil Quality Kit- EC meter: http://soils.usda.gov/sqi/soil_quality/assessment/kit2.html • Visual assessment (salts on soil surface during drought or when irrigation is withheld) • Client interview	Electrical Conductivity (EC) – average reduction in EC for the field or planning area/unit	UH ADSC soil test for EC

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Contaminants: Animal Waste and Other Organics – N	Nitrogen nutrient levels from applied animal waste and other organics restrict desired use of the land.	Same as National: Nitrogen nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • Manure/effluent analysis • NRE (Nitrogen Risk Evaluator) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Testing for Soil Nitrogen and Phosphorus for Environmental Pollution Monitoring: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/scm_6.pdf • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of nitrogen (N) reduced per acre for the field or planning area/unit	Compare before and after application rates
Soil Condition – Contaminants: Animal Waste and Other Organics – P	Phosphorus nutrient levels from applied animal waste and other organics restrict desired use of the land.	Same as National: Phosphorus nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • Manure/effluent analysis • PRRE (Phosphorus Runoff Risk Evaluator) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Testing for Soil Nitrogen and Phosphorus for Environmental Pollution Monitoring: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/scm_6.pdf • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of phosphorus (P) reduced per acre for the field or planning area/unit	Compare before and after application rates

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Contaminants: Animal Waste and Other Organics – K	Potassium nutrient levels from applied animal waste and other organics restrict desired use of the land.	Same as National: Potassium nutrient application levels do not exceed soil storage/plant uptake capacities based on soil test recommendations and risk analysis results.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • Manure/effluent analysis • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of potassium (K) reduced per acre for the field or planning area/unit	Compare before and after application rates
Soil Condition – Contaminants: Commercial Fertilizer – N	Over application of nitrogen degrades plant health and vigor or exceeds the soil capacity to retain nutrients.	Same as National: Soil nutrient levels of nitrogen do not exceed crop needs based on realistic yield goals, and appropriate pH levels are maintained.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • NRE (Nitrogen Risk Evaluator) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Hawaii Soils Technical Note No. 11: AS-1, AS-2, AS-3, SCM-1 and SCM-6: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/ • Soil Quality Kit-pH meter (Guide: http://soils.usda.gov/sqi/soil_quality/assessment/kit2.html) • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of nitrogen (N) reduced per acre for the field or planning area/unit	Compare before and after application rates

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Contaminants: Commercial Fertilizer – P	Over application of phosphorus degrades plant health and vigor or exceeds the soil capacity to retain nutrients.	Same as National: Soil nutrient levels of phosphorus do not exceed crop needs based on realistic yield goals, and appropriate pH levels are maintained.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • PRRE (Phosphorus Runoff Risk Evaluator) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Hawaii Soils Technical Note No. 11: AS-1, AS-2, AS-3, SCM-1 and SCM-6: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/ • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of phosphorus (P) reduced per acre for the field or planning area/unit	Compare before and after application rates
Soil Condition – Contaminants: Commercial Fertilizer – K	Over application of potassium degrades plant health and vigor or exceeds the soil capacity to retain nutrients.	Same as National: Soil nutrient levels of potassium do not exceed crop needs based on realistic yield goals, and appropriate pH levels are maintained.	• Client interview (Does application comply with approved nutrient management plan?) • Application records • Yield records/history • PRRE (Phosphorus Runoff Risk Evaluator) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Hawaii Soils Technical Note No. 11: AS-1, AS-2, AS-3, SCM-1 and SCM-6: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/ • Plant tissue analysis • UH Extension Service recommendations	Pounds/ Acre/Year – average annual pounds of potassium (K) reduced per acre for the field or planning area/unit	Compare before and after application rates

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
SOIL					
Soil Condition – Contaminants: Residual Pesticides	Residual pesticides in the soil have an adverse effect on non-targeted plants and animals.	Same as National: Pesticides are applied, stored, handled, and disposed of, so that residues in the soil do not adversely affect non-targeted plants and animals.	• Visual assessment (How are the pesticides stored? Is the pesticide label being followed?) • Client interview (Is the pesticide label being followed? Does application comply with approved pest management plan?) • WIN-PST: http://www.wcc.nrcs.usda.gov/pestmgt/winpst.html) • Specialized soil tests • Plant and animal tissue test • DOA List of Licensed Pesticides: http://www.hawaiiag.org/hdoa/pi_pest_list.htm • UH Extension Service recommendations • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf	Non Measurable	Non Measurable
Soil Condition – Damage from Sediment Deposition	Sediment deposition damages or restricts land use/management or adversely affects ecological processes.	Same as National: Sediment deposition is sufficiently reduced to maintain desired land use/management and ecological processes.	• Visual—(area damaged by sediment, crop and wildlife habitat damage) • Client interview • Area measurement • Maps	Acres/Year – average annual acres of sediment deposition reduced for the field or planning area/unit	Measure before and after conditions

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quantity – Rangeland Hydrologic Cycle	The capacity to capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant).	Same as National: Indicators of Rangeland Health Attribute rating for Hydrologic Cycle are Slight to Moderate or less departure from Ecological Reference Sheet (ESD).	• Rangeland Health Attribute rating for Hydrologic Cycle is =>3	Departure from Ecological Reference Sheet (ESD) categories – amount of departure, by numeric value, from Ecological Reference Sheet for the field or planning area/unit. 1=None to Slight, 2=Slight to Moderate, 3=Moderate, 4=Moderate to Extreme, or 5=Extreme	Ecological Reference Sheet
Water Quantity – Excessive Seepage	Subsurface water oozing to the surface restricts land use and management.	Same as National: Subsurface water is managed to limit periods of saturation that are unfavorable to the present or intended land use. Management complies with wetland policies.	• Visual assessment (presence of water, prevalence of hydrophytic vegetation and soil) • Client interview • Area measurement • Hydric soils list (use Soil Data Viewer) • National Wetland Inventory	Acres/Year – average annual acres of seep reduced for the field or planning area/unit	Measure before and after conditions

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quantity – Excessive Runoff, Flooding, or Ponding	The land becomes inundated, restricting land use and management.	Same as National: Excess water amounts and/or rates of flow are controlled, consistent with desired present or intended land use goals and wetland policies.	• Visual assessment (sediment deposition, debris line, water marks, etc) • Client interview • Area measurement • Nat. Eng. Handbook, Part 650, Chapter 2 Estimating Runoff and Peak Discharges: http://www.info.usda.gov/CED/ftp/CED/EFH-Ch02.pdf • Hydrologic models, e.g. HECRAS, TR-20, TR-55: http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models.html • FOTG, Section II, Soils Information, Soil Properties and Features, Water Features: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI	Non Measurable	Non Measurable
Water Quantity – Excessive Subsurface Water	Water saturates upper soil layers, restricting land use and management.	Same as National: Subsurface water is managed to limit periods of saturation compatible with the present or intended land use and wetland policies.	• Visual assessment (presence of water, prevalence of hydrophytic vegetation & soil) • Visual assessment of soil cores and coring holes • Client interview • Area measurement • Hydric soils list (use Soil Data Viewer) • National Wetland Inventory maps • FOTG, Section II, Soils Information, Soil Properties and Features, Water Features (determine if soil has a period of high water table): http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI • Plant quality and quantity measurements • Nat. Eng. Handbook, Part 650 EFH-Chapter 14 Water Management Drainage: http://www.info.usda.gov/CED/ftp/CED/EFH-Ch14.pdf	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quantity – Drifted Snow *(Not a concern in Hawaii.)*	Wind-blown snow forms deposits and accumulates around and over surface structures, restricting ingress, egress, and conveyance of humans and animals.	Same as National: Snowdrifts are reduced or prevented so as to allow ingress, egress, and conveyance of humans and animals.	• Visual assessment	Non Measurable	Non Measurable
Water Quantity – Inadequate Outlets	Natural or constructed outlets are too small to remove excess water in a timely manner.	Same as National: Outlets are designed, installed, upgraded or maintained to adequately convey water for present or intended uses.	• Visual assessment (out of bank flow, debris line, soil erosion) • See if capacity fits inflow using Nat. Eng. Handbook, Part 650 EFH – Chapters 2 and 3 : http://www.info.usda.gov/CED/Default.cfm?xSbj=53&xAud=24 • Client interview • Hydrologic models, e.g. HECRAS, TR-20, TR-55: http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models.html	Non Measurable	Non Measurable
Water Quantity – Inefficient Water Use on Irrigated Land	Limited water supplies are not optimally utilized.	Same as National: Land and water management is planned and coordinated to provide optimal use of natural and applied moisture.	• Visual assessment (plant drought stress, excessive inundation or runoff) • Client interview • Nat. Eng. Handbook, Part 652, Irrigation Guide: http://www.wcc.nrcs.usda.gov/nrcsirrig/irrig-handbooks-part652.html • Plant quality and quantity measurements	Acre-Inches/ Acre/Year – average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	HI-ENG-19— Irrigation Water Savings

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quantity – Inefficient Water Use on Nonirrigated Land	Natural moisture is not optimally utilized.	Same as National: Management provides optimum use of natural moisture for the present or intended land use.	• Visual assessment • Client interview (rotation schedule and mulching practices) • Plant quality and quantity measurements	Acre-Inches/ Acre/Year – average annual acre-inches of water per acre used more beneficially for the field or planning area/unit	Plant quality and quantity measure-ments
Water Quantity – Reduced Capacity of Conveyances by Sediment Deposition	Sediment deposits in ditches, canals, culverts, and other water conveyances reduce the desired flow capacity.	Same as National: Conveyance structures are upgraded or maintained to adequately convey water for present or intended uses.	• Visual assessment (sediment deposition) • Client interview • Area measurement • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must achieve: 5. Percent Embeddedness >=1.0 • Scope and Effect Determinations and Wetland Uses for the 1985 Act Compliance, National Food Security Act Manual, Part 515	Cubic yards – volume of sediment in cubic yards removed to maintain water conveyances for the field or planning area/unit	Measure volume of sediment removed
Water Quantity – Reduced Storage of Water Bodies by Sediment Accumulation	Sediment deposits in water bodies reduce the desired volume capacity.	Same as National: Water bodies and contributing source areas are treated to allow sufficient water storage for present and intended uses.	• Soil probe • Analysis of incoming water for suspended sediment • Client interview • Nat. Eng. Handbook, Part 650 EFH – Chapters 2 and 3: http://www.info.usda.gov/CED/Default.cfm?xSbj=53&xAud=24 • Nat. Eng. Handbook, Part 631, Section 3 Sedimentation: http://www.info.usda.gov/CED/ftp/CED/neh-3.htm • Hydrologic models, e.g., HECRAS, TR-20, TR-55: http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models.html	Acre-Inches/Year – average annual reduction in acre-inches in sediment deposition within water bodies for the field or planning area/unit	Nat. Eng. Handbook, Part 631, Section 3 Sedimenta-tion: http://www.info.usda.gov/CED/ftp/CED/neh-3.htm

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quantity – Aquifer Overdraft	Water withdrawals exceed the safe yield for the aquifer.	Same as National: Land and water management are coordinated to balance aquifer recharge and withdrawals to maintain the safe yield for the aquifer.	• Water level measurements • Client interview • Dept. of Water Supply reports on status of aquifer yield	Acre-Inches/Year – average annual reduction in acre-inches of groundwater overdraft for the field or planning area/unit	HI-ENG-19, Irrigation Water Savings
Water Quantity – Insufficient Flows in Watercourses	Water flows are not consistently available in sufficient quantities to support ecological processes and land use and management.	Same as National: Authorized uses and management of water are coordinated to minimize the impacts on watercourse flows.	• Visual assessment • Client interview (Does producer have necessary permits from the DLNR Water Resources Commission?) • USGS surface water data: http://waterdata.usgs.gov/hi/nwis/sw • Gauge station data • Consumptive use/allocation water rights • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must achieve: 4. Channel Flow Alteration >=1.2 and 9. Habitat Available for Native Species >= 1.0.	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Harmful Levels of Pesticides in Groundwater	Residues resulting from the use of pest control chemicals degrade groundwater quality.	Same as National: Pesticides are applied, stored, handled, disposed of, and managed so that groundwater uses are not adversely affected.	• Client interview (Is the pesticide label being followed? Does application comply with approved pest management plan?) • Visual assessment (How are the pesticides stored? Is the pesticide label being followed?) • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone and groundwater chemical sampling and assay • WIN-PST: http://www.wcc.nrcs.usda.gov/pestmgt/winpst.html) • UH ADSC soil test: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • DOH Groundwater Contamination Maps http://hawaii.gov/health/environmental/water/sdwb/conmaps/conmaps.html • DOA List of Licensed Pesticides: http://www.hawaiiag.org/hdoa/pi_pest_list.htm • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf • Water Quality Risk Assessment: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/water/ • UH Extension Service recommendations	Non Measurable	Non Measurable
Water Quality – Excessive Nutrients and Organics in Groundwater	Pollution from natural or human-induced nutrients such as N, P, and S (including animal and other wastes) degrades groundwater quality.	Same as National: Nutrients and organics are stored, handled, disposed of, and applied so that groundwater uses are not adversely affected.	• Client interview (Does application comply with approved nutrient management plan?) • Visual assessment (How are the nutrients and organics stored?) • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone & groundwater chemical/particle sampling & assay • Nitrate Risk Evaluator (NRE) • Nat. Eng. Handbook, Part 651, Ag. Waste Mgt. Field Handbook: http://www.ftw.nrcs.usda.gov/awmfh.html • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf • UH Extension Service recommendations	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Excessive Salinity in Groundwater	Pollution from salts such as Ca, Mg, Na, K, HCO3, CO3, Cl, and SO4 degrade groundwater quality.	Same as National, except as italicized: Salts are stored, handled, disposed of, applied, and managed so that groundwater uses are not adversely affected. *Pumping of groundwater does not increase salinity.*	• UH ADSC test for EC. ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Soil Quality Kit- EC meter (Guide: http://soils.usda.gov/sqi/soil_quality/assessment/kit2.html) • Client interview • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone & groundwater salinity sampling (total dissolved solids [TDS]) • Nat. Eng. Handbook, Part 652, Irrigation Guide: http://www.wcc.nrcs.usda.gov/nrcsirrig/irrig-handbooks-part652.html	Electrical Conductivity (EC) – average reduction in EC for the field or planning area/unit	UH ADSC test for EC or Soil Quality Kit-EC meter
Water Quality – Harmful Levels of Heavy Metals in Groundwater	Natural or human-induced metal pollutants present in toxic amounts degrade groundwater quality.	Same as National: Materials containing heavy metals are stored, handled, disposed of, applied, and managed so that groundwater uses are not adversely affected.	• Client interview (Does producer store batteries on property?) • Visual assessment • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone and groundwater chemical sampling and assay	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Harmful Levels of Pathogens in Groundwater	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades groundwater quality.	Same as National: Materials that harbor pathogens are stored, handled, disposed of, applied, and managed so that groundwater uses are not adversely affected.	• Client interview (Does producer comply with approved animal waste management plan?) • Visual assessment • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone and groundwater chemical sampling and assay • Sample associated surface water • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf	Non Measurable	Non Measurable
Water Quality – Harmful Levels of Petroleum in Groundwater	Fuel, oil, gasoline, and other hydrocarbons present in toxic amounts degrade groundwater quality.	Same as National: Petroleum products are used, stored, handled, disposed of, and managed so that groundwater uses are not adversely affected.	• Client interview (Does producer have required permits from DOH for storing petrochemicals?) • Visual assessment • County Dept. of Water Supply water quality reports (Honolulu: http://www.hbws.org/cssweb/display.cfm?sid=1060) • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Vadose zone and groundwater chemical sampling and assay • DOH Groundwater Contamination Maps http://hawaii.gov/health/environmental/water/sdwb/conmaps/conmaps.html	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Harmful Levels of Pesticides in Surface Water	Pest control chemicals present in toxic amounts degrade surface water quality.	Same as National: Pesticides are applied, stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	• Client interview (Is the pesticide label being followed? Does application comply with approved pest management plan?) • Visual assessment • Surface water chemical sampling assay • WIN-PST: http://www.wcc.nrcs.usda.gov/pestmgt/winpst.html) • UH ADSC test. ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • UH Extension Service recommendations • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • Water Quality Risk Assessment Tech Note: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/water/ • Native Aquatic Wildlife Inventory Worksheet, Tech Note 2: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/ • DOA List of Licensed Pesticides: http://www.hawaiiag.org/hdoa/pi_pest_list.htm • Check for soil compaction (see Soil Condition - Compaction Resource Concern above.) • DOH Water Quality Standards for acceptable level of some pesticides (and other pollutants) in streams, Hawaii Administrative Rules section 11-54-04: Basic water quality criteria applicable to all waters: http://hawaii.gov/health/about/rules/11-54.pdf	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Excessive Nutrients and Organics in Surface Water	Pollution from natural or human induced nutrients such as N, P, and S (including animal and other wastes) degrades surface water quality.	Same as National: Nutrients and organics are stored, handled, disposed of, and managed so that surface water uses are not adversely affected.	• Client interview (Does application comply with approved nutrient management plan?) • Visual assessment • Surface water chemical/particle sampling and assay • Phosphorus Runoff Risk Evaluator (PRRE) • Nitrate Risk Evaluator (NRE) • UH ADSC test. ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • UH Extension Service recommendations • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • Water Quality Risk Assessment Tech Note: http://www.hi.nrcs.usda.gov/programs/ • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 2. Plant growth (indicator of eutrophication) >= 1.5. • Native Aquatic Wildlife Inventory Worksheet, Tech Note No. 2: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/ • National Engineering Handbook, Part 651, Ag. Waste Mgt. Field Handbook: http://www.ftw.nrcs.usda.gov/awmfh.html • DOH Water Quality Standards for acceptable level of pesticides (and other pollutants) in streams, Hawaii Administrative Rules section 11-54-05.2: http://hawaii.gov/health/about/rules/11-54.pdf	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Excessive Suspended Sediment and Turbidity in Surface Water	Excessive concentrations of mineral or organic particles, algae, or organic stains degrade surface water quality.	Same as National: Delivery or suspension of mineral and organic particles, and excessive algae growth or organic stains, is managed such that surface water uses are not adversely affected.	• Client interview • Visual assessment • Surface water chemical/particle sampling and assay • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • Water Quality Risk Assessment Tech Note: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/water/ • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must meet: Must meet No. 1 Turbidity >= 1.5 and No. 2 Plant Growth >= 1.5. • Native Aquatic Wildlife Inventory Worksheet, Tech Note No. 2: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/ • US Geological Survey Coral Reef Assessment and Monitoring Program data: http://coralreefs.wr.usgs.gov/intro.html • DOH Water Quality Standards for acceptable level of turbidity in streams, Hawaii Administrative Rules 11-54-05.2: http://hawaii.gov/health/about/rules/11-54.pdf	Non Measurable	Non Measurable
Water Quality – Excessive Salinity in Surface Water	Pollution from salts such as Ca, Mg, Na, K, HCO3, CO3, Cl, and SO4 degrades surface water quality.	Same as National: Salts are stored, handled, disposed of, applied, and managed so that surface water uses are not adversely affected.	• UH ADSC test for EC. ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/soils/soils_11_ces_publications/as_4.pdf • Soil Quality Kit- EC meter (Guide: http://soils.usda.gov/sqi/soil_quality/assessment/kit2.html) • Client interview • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must meet: 7. Canopy/Shade must score >= 1.6. • Native Aquatic Wildlife Inventory Worksheet, Tech Note No. 2: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/ • DOH Water Quality Standards for acceptable level of salinity in streams: Specific Conductance – Not more than three hundred micromhos/centimeter. • National Engineering Handbook, Part 652, Irrigation Guide: http://www.wcc.nrcs.usda.gov/nrcsirrig/irrig-handbooks-part652.html	Electrical Conductivity (EC) – average reduction in EC for the field or planning area/unit	UH ADSC test for EC or Soil Quality Kit-EC meter

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Harmful Levels of Heavy Metals in Surface Water	Natural or human-induced metal pollutants are present in toxic amounts that degrade surface water quality.	Same as National: Materials containing heavy metals are stored, handled, disposed of, applied, and managed so that surface water uses are not adversely affected.	• Client interview (Does producer store batteries on property?) • Visual assessment • Surface water chemical sampling and assay • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • DOH Water Quality Standards: Basic water quality criteria applicable to all waters, for acceptable level of heavy metals (and other pollutants) in streams, Hawaii Administrative Rules section 11-54-04: http://hawaii.gov/health/about/rules/11-54.pdf	Non Measurable	Non Measurable
Water Quality – Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality.	Same as National: Use and management of land and water are coordinated to minimize impacts on surface water temperatures.	• Client interview • Visual assessment • Surface water temperature sampling and assay • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must meet: 7. Canopy/Shade must score >= 1.6. • DOH Water Quality Standard for acceptable temperature in surface water: Temperature shall not vary more than one degree Celsius from ambient conditions.	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
WATER					
Water Quality – Harmful Levels of Pathogens in Surface Water	Kinds and numbers of viruses, protozoa, and bacteria are present at a level that degrades surface water quality.	Same as National: Materials that harbor pathogens are stored, handled, disposed of, applied, and managed so that surface water uses are not adversely affected.	• Client interview (Does producer comply with approved animal waste management plan?) • Visual assessment (animal waste in surface water) • Surface water sampling and assay • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • DOH Water Quality Standards for pathogenic organisms in surface water (non-numeric) 11-54-04(a) (4). • Farm*A*Syst assessment HAPPI farm series: http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/HF-1.pdf	Non Measurable	Non Measurable
Water Quality – Harmful Levels of Petroleum in Surface Water	Fuel, oil, gasoline, and other hydrocarbons present in toxic amounts degrade surface water quality.	Same as National: Petroleum products are used, stored, handled, and disposed of so that groundwater uses are not adversely affected.	• Client interview (Does producer have required permits from DOH for storing petrochemicals?) • Visual assessment • Surface water chemical sampling and assay • USGS water quality data: http://hi.water.usgs.gov/qw/index.html • Water Quality Assessment and Monitoring Guidance Documents: http://www.wcc.nrcs.usda.gov/wqam/wqam-docs.html • DOH Water Quality Standards: Basic water quality criteria applicable to all waters, for acceptable level of petrochemicals (and other pollutants) in streams, Hawaii Administrative Rules section 11-54-04: http://hawaii.gov/health/about/rules/11-54.pdf	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
AIR					
Air Quality – Particulate matter less than 10 micrometers in diameter (PM 10)	Particulate matter less than 10 micrometers in diameter are suspended in the air, causing potential health hazards to humans and animals.	Same as National, except as italicized: Land use and management operations reduce PM-10 emissions into the atmosphere and comply with requirements of the *State of Hawaii Department of Health air quality standards.*	• Client and neighbor interviews (complaints due to fugitive dust) • Visual assessment • DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm • Air quality analysis: http://www.epa.gov/ttn/amtic/	Pounds/Year – average annual pounds of reduced PM-10 emissions for the field or planning area/unit	DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm
Air Quality – Particulate matter less than 2.5 micrometers in diameter (PM 2.5)	Particulate matter less than 2.5 micrometers in diameter are suspended in the air, causing potential health hazards to humans and animals.	Same as National, except as italicized: Land use and management operations reduce PM-2.5 emissions into the atmosphere and comply with requirements of the *State of Hawaii Department of Health air quality standards.*	• Client and neighbor interviews (complaints due to fugitive dust) • Visual assessment • DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm • Air quality analysis: http://www.epa.gov/ttn/amtic/	Pounds/Year – average annual pounds of reduced PM-2.5 emissions for the field or planning area/unit	DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm
Air Quality – Excessive Ozone	High concentrations of ozone are adversely affecting human health, reducing plant yields, and creating smog.	Same as National, except as italicized: Land use and management operations reduce ozone precursors and comply with requirements of the *State of Hawaii Department of Health air quality standards.*	• Client interview • Visual assessment • DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm • Air quality analysis: http://www.epa.gov/ttn/amtic/	Pounds/Year – average annual pounds of reduced ozone precursors emissions for the field or planning area/unit	DOH Annual Summary Hawaii Air Quality Data: http://www.state.hi.us/doh/eh/cab/cabmaps/report.htm

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
AIR					
Air Quality – Excessive Greenhouse Gas: CO2 (carbon dioxide)	Increased CO2 concentrations are adversely affecting ecosystem processes.	Same as National: Land use and management operations reduce CO2 emissions into the atmosphere and comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and local regulations.	• Model simulations (Century, EPIC, CQUESTER); sampling for soil carbon or International Panel on Climate Change methodology • Soil Conditioning Index (positive number indicates storing more atmospheric CO2) • Air quality analysis: http://www.epa.gov/ttn/amtic/	Non Measurable	Non Measurable
Air Quality – Excessive Greenhouse Gas: N2O (nitrous oxide)	Increased N2O concentrations are adversely affecting ecosystem processes.	Same as National: Land use and management operations reduce N2O emissions into the atmosphere and comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and local regulations.	• Client interview (Is client following irrigation water management plan?) • Visual assessment (observe soil sample for presence of many visible pores and observe field for signs of over irrigation and soil saturation) • Model simulations (NLEAP or DayCENT), or IPCC methodology • Air quality analysis: http://www.epa.gov/ttn/amtic/	Non Measurable	Non Measurable
Air Quality – Excessive Greenhouse Gas: CH4 (methane)	Increased CH4 concentrations are adversely affecting ecosystem processes.	Same as National: Criteria: Land use and management operations reduce CH4 emissions into the atmosphere and comply with requirements of the State or Federal Implementation Plan and all applicable Federal, Tribal, State, and local regulations.	• Client interview (Is producer using methane generated on farm?) • Methane detector • IPCC methodology • Air quality analysis: http://www.epa.gov/ttn/amtic/	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
AIR					
Air Quality – Ammonia (NH3)	Animal waste and inorganic commercial fertilizers emit ammonia that contributes to odor, is a PM2.5 precursor, and contributes to acid rain.	Same as National: Land use and management operations reduce NH3 emissions into the atmosphere and comply with requirements of all applicable Federal, Tribal, State, and local regulations.	• Client and neighbor interviews (complaints due to smell) • Olfactory assessment (ammonia odor not overly overpowering at feedlots or other concentrated animal feeding operations) • Approved NRCS tools and technical guidance • Air quality analysis: http://www.epa.gov/ttn/amtic/	Pounds/ Year – average annual pounds of reduced NH3 emissions for the field or planning area/unit	Approved NRCS tools and technical guidance
Air Quality – Chemical Drift	Materials applied to control pests drift downwind and contaminate/injure non-targeted fields, crops, soils, water, animals and humans.	Same as National: Land use and management operations reduce chemical drift into the atmosphere and comply with all applicable Federal, Tribal, State, and local regulations, and applicable label directions.	• Client and neighbor interviews (Complaints due to chemical applications? Is the pesticide label being followed? Does application comply with approved pest management plan?) • Visual assessment (overspray of intended target area)	Non Measurable	Non Measurable
Air Quality – Objectionable Odors	Land use and management operations produce offensive smells.	Same as National: Odor-producing facilities and activities are planned and sited to mitigate potential nuisance impacts and meet all applicable Tribal, State, and local regulations.	• Olfactory assessment • Client and neighbor interviews (complaints due to smell) • Air quality analysis: http://www.epa.gov/ttn/amtic/	Non Measurable	Non Measurable
Air Quality – Reduced Visibility	Sight distance is impaired due to airborne particles causing unsafe conditions and impeded viewing of natural vistas, especially in Class I viewing areas (primarily national parks and monuments).	Same as National: Land use and management operations reduce particle emission into the atmosphere and comply with all applicable Federal, Tribal, State, and local regulations, including State and local smoke and/or burn management plans.	• Visual assessment (Is producer's activities is emitting airborne particles? Is visibility impaired?) • Client and neighbor interviews (Complaints?) • Air quality analysis: http://www.epa.gov/ttn/amtic/	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Reporting Measurement Units**	**Reporting Measurement Tool**
AIR					
Air Quality – Undesirable Air Movement	Wind velocities (too little or too much) reduce animal or plant productivity, impact human comfort and increase energy consumption.	Same as National: Land use and management operations mitigate excessive or deficient air movement.	• Visual assessment (animal or plant stress or damage) • Client interview (increase in disease due to too little wind velocity, or plant damage due to excess wind) • Anemometer (measures wind velocity)	Non Measurable	Non Measurable
Air Quality – Adverse Air Temperature	Air temperatures (too cold or too hot) reduce animal or plant productivity, impact human comfort and increase energy consumption.	Same as National: Land use and management operations mitigate temperature extremes.	• Chill factor indices and heat indices • Visual assessment (plant or animal stress or damage) • Client interview	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
PLANTS					
Plants not adapted or suited	Plants are not adapted and/or suited to site conditions or client objectives.	Same as National (except as noted in italics): Selected plants are adapted to the soil and climatic conditions or the site is modified to make it suitable for the desired plants. Plants are sustainable, do not negatively impact other resources, and meet client objectives. For specific land uses, additional criteria apply: **Cropland:** A healthy stand with vigorous growth. Yields 75% of client expectations. **Rangeland:** Plants on or planned for the site are listed in applicable Ecological Site Descriptions (ESD). *Until Ecological Site Descriptions are developed for Hawaii, plants must be approved by the State Range Mgt Specialist.* ***Pastureland:*** Plants on or planned for the site have a site adaptation score greater than 3 using Pasture Condition Scoring (PCS)and are listed in applicable Forage Suitability Groups (FSG) reports. *Until Forage Suitability Groups are developed for Hawaii, plants must be approved by the State Range Mgt Specialist.* ***Hayland:*** Plants on or planned for the site are listed in applicable Forage Suitability Groups (FSG) reports. *Until Forage Suitability Groups are developed for Hawaii, plants must be approved by the State Range Mgt Specialist.* **Forestland/Agroforest:** Plants on or planned for the site are listed in Ecological Site Descriptions (ESD). *Until Ecological Site Descriptions are developed for Hawaii, plants must be approved by the State Range Mgt Specialist*.	• Client interview • On-site investigation and records • Hawaii Vegetation Guide for environmental site criteria: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/vegetative/veg_7_hawaii_vegetative_guide/ • Riparian Restoration Plant Database http://www.ctahr.hawaii.edu/rnre/Riparian_Restoration_Plant_Database.asp • Pasture Condition Scoring (PCS) (Score Sheet: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/pasture-score-sheet.pdf Guide: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/pasture-score-guide.pdf) • PLANTS database: http://plants.usda.gov/ • Soil interpretations – FOTG Section II: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI • Soil survey manuscripts – FOTG Section II: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI • UH Extension Service information	Non Measurable	Non measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
PLANTS					
Plant Condition – Productivity, Health and Vigor	Plants do not produce the yields, quality, and soil cover to meet client objectives.	Same as National (except as noted in italics): Selected plants on or planned for the site are sufficiently productive to meet or exceed client needs. For specific land uses, additional criteria apply: Cropland: A healthy stand with vigorous growth produces at least 75% of site potential. Rangeland: The plant community has a similarity index of at least 60% or an upward trend for similarity indices less than 60%. *Until rangeland similarity indices are developed for Hawaii, consult State Range Mgt. Specialist.* Pastureland: Forage yields are at least 75% of high management estimates cited in Forage Suitability Groups (FSG) reports. *Until Forage Suitability Groups are developed for Hawaii, complete HI-RANGE-1 Range and Forage Inventory Worksheet and consult State Range Mgt Specialist.* Hayland: Forage yields are at least 75% of high management estimates cited in FSG reports. *Until Forage Suitability Groups are developed for Hawaii, complete HI-RANGE-1 Range and Forage Inventory Worksheet and consult State Range Mgt Specialist.* Forestland/Agroforest: Forests consist of healthy stands with vigorous growth having a stand density within 25% of optimum stocking on a stems/acre basis. Plants chosen for Agroforest applications are consistent with Conservation Tree and Shrub Groups (CTSG) listings and height performance.	• Client interview • Hawaii Vegetation Guide for environmental site criteria: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/vegetative/veg_7_hawaii_vegetative_guide/ • Riparian Restoration Plant Database http://www.ctahr.hawaii.edu/rnre/Riparian_Restoration_Plant_Database.asp • Plant tissue and harvest analysis • Crop scouting • National Range and Pasture Handbook: http://www.glti.nrcs.usda.gov/technical/publications/nrph.html • Rising plate meter • Plot sampling of vegetation • Soil survey reports FOTG Section II: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI • Soil testing • Pasture Condition Scoring (Score Sheet: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/pasture-score-sheet.pdf Guide: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/pasture-score-guide.pdf) • Keys for disease and insect symptoms • Keys for nutrient deficiencies, toxicities, and other conditions • Rangeland Health Assessment, NRPH, Exhibit 4-8: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/nrph/nrph-ch4.pdf • Stocking rate of desired species • Stocking measurement for the tree stands • Conservation Tree and Shrub Groups (CTSG)	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
PLANTS					
Plant Condition – Threatened or Endangered Plant Species: Plant Species Listed or Proposed for Listing under the Endangered Species Act	The site includes individuals, habitat or potential habitat for one or more plant species listed or proposed for listing under the Endangered Species Act.	Same as National: Populations and/or habitats of Threatened and Endangered plant species are managed to maintain, increase or improve current populations, health, or sustainability.	• Client interview • Inventory site • US Fish and Wildlife Service endangered species lists: http://endangered.fws.gov/wildlife.html#Species • PLANTS Website: http://plants.usda.gov/ • Critical Habitat Tables with Primary Constituents Tech Note No. 13: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Heritage Data Query Procedure Tech Note No. 10: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/biology_10_hawaii_natural_heritage.doc • Fish and wildlife recovery plans • Consultation with appropriate federal, state, and local agencies/groups	Non Measurable	Non Measurable
Plant Condition – Threatened or Endangered Plant Species: Declining Species, Species of Concern	The site includes individuals, habitat or potential habitat for one or more plant species that the State or Tribal government with jurisdiction, or the State Technical Committee, has identified as a species of concern. This includes plant species that have been identified as candidates for listing under the Endangered Species Act.	Same as National: Populations and/or habitats of plant species of concern are managed to maintain, increase, or improve current populations, health, or sustainability.	• Client interview • Inventory site • US Fish and Wildlife Service endangered species lists: http://endangered.fws.gov/wildlife.html#Species • PLANTS Website: http://plants.usda.gov/ • Critical Habitat Tables with Primary Constituents Tech Note No. 13: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Heritage Data Query Procedure Tech Note No. 10: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/biology_10_hawaii_natural_heritage.doc • Riparian Restoration Plant Database http://www.ctahr.hawaii.edu/rnre/Riparian_Restoration_Plant_Database.asp • Fish and wildlife recovery plans • Consultation with appropriate federal, state, and local agencies/groups	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
PLANTS					
Plant Condition – Noxious and Invasive Plants	The site has noxious or invasive plants present.	Same as National: The site is managed to control noxious and invasive plants and to minimize their spread.	• Client interview • Inventory site • Consult weed management associations • Consultation with appropriate federal, state, and local agencies/groups • State and local noxious weed list: http://aquat1.ifas.ufl.edu/seagrant/hiinv.html • Weeds of Hawai`i's Pastures and Natural Areas, CTAHR publication by Philip Motooka, et.al. • PLANTS Website: http://plants.usda.gov/	Non Measurable	Non Measurable
Plant Condition – Forage Quality and Palatability	Plants do not have adequate nutritive value or palatability for the intended use.	Same as National: Forage plants are managed to produce the desired nutritive value and palatability for the intended use.	• Client interview (goals) • Body conditioning score • NIRS Forage Quality Analysis (NUTBAL) (Technical support document available online at: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/nutbal-tech-support.pdf) • Plant tissue analysis	Non Measurable	Non Measurable
Plant Condition – Wildfire Hazard	The kinds and amounts of fuel loadings (plant biomass) pose risks to human safety, structures, and resources, should wildfire occur.	Same as National: Fuel loadings are reduced and/or isolated to meet client needs in minimizing the risk and incidence of wildfire.	• Client interview (Goals for reduction of wildfire hazard) • Visual assessment • Site and flammable biomass inventories • Aerial photo analysis	Acres/Year – average annual acres protected from wildfire for the field of planning area/unit	Annual acres protected by installed practice(s) as planned or reported

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Fish and Wildlife – Inadequate Food	Quantity and quality of food are unavailable to meet the life history requirements of the species or guild of species of concern.	Same as National: Food availability meets the life history requirements of the species or guild of species of concern.	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, No. 11 birds of North America, and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 7. Canopy/Shade >= 1.6. • Client interview • Visual assessment • Inventory of food species • Aerial photo analysis • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide
Fish and Wildlife – Inadequate Cover/Shelter	Cover/shelter for the species or guild of species of concern is unavailable or inadequate. This includes lack of hiding, thermal, and/or refuge cover.	Same as National: The ecosystem or habit types support the necessary plant species in adequate diversity, abundance, and physical structure; and the connectivity of fish and wildlife cover is adequate to support, over time, the species or guild of species of concern.	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, No. 11 birds of North America and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Visual assessment • Client interview • Inventory of cover/shelter • Aerial photo analysis • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Fish and Wildlife – Inadequate Water	The quantity and quality of water is unacceptable for the species or guild of species of concern.	Same as National: The quantity and quality of water meets the life history requirements of the species or guild of species of concern.	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, and No. 11 birds of North America: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 4. Channel Flow Alteration >=1.2 and for element 9. Habitat Available for Native Species >=1.0. • Client interview • Visual assessment • Inventory of water supplies • Aerial photo analysis • Surface water dissolved oxygen sampling and assay • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide
Fish and Wildlife – Inadequate Space	Lack of required areas disrupts the life history of the species or guild of species of concern.	Same as National: Area is adequate to meet life history requirements of the species or guild of species of concern. (Examples: staging areas for rest and feeding, lekking areas for breeding, migratory movement corridors.)	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, and No. 11 birds of North America: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 4. Channel Flow Alteration >=1.2 and for element 9. Habitat Available for Native Species >=1.0. • Client interview • Visual assessment • Inventory of space/areas • Aerial photo analysis • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Fish and Wildlife – Habitat Fragmentation	Habitat has insufficient structure, extent, and connectivity to provide ecological functions and/or achieve management objectives.	Same as National: Fish and wildlife habitats are connected and are maintained sufficiently to support the species or guild of species of concern.	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, No. 11 birds of North America and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 4. Channel Flow Alteration >=1.2 and for element 9. Habitat Available for Native Species >=1.0. • Client interview • Visual assessment • Aquatic and terrestrial habitat evaluation procedures • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide
Fish and Wildlife – Imbalance Among and Within Populations	Populations are not in proportion to available quantities and qualities of food (plants, predator/prey), cover/shelter, water, and space and other life history requirements.	Same as National: Land and water use and management are consistent with direct population management activities conducted by fish and wildlife agencies.	• Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 10 Hawaii Natural Heritage Data Query Procedures, No. 11 birds of North America and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology • Hawaii Stream Visual Assessment Protocol: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/biology/biology_09_hawaii_stream_protocol/. Must score for element 4. Channel Flow Alteration >=1.2 and for element 9. Habitat Available for Native Species >=1.0. • Aquatic and terrestrial habitat evaluation procedures • Client interview • National Biology Handbook: http://www.nrcs.usda.gov/technical/ECS/wildlife/NatBioHandbook.pdf	Non Measurable; based on habitat evaluation guide	Non Measurable; based on habitat evaluation guide

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Fish and Wildlife – Threatened and Endangered Fish and Wildlife Species: Fish and Wildlife Species Listed or Proposed for Listing under the Endangered Species Act	The site includes individuals, habitat or potential habitat for one or more fish or wildlife species listed or proposed for listing under the Endangered Species Act.	Same as National: Populations and/or habitats of Threatened and endangered fish and wildlife species and/or habitats they occupy are managed to maintain, increase, or improve current populations, health, or sustainability.	• Inventory of presence/absence of T&E species (Hawaii Natural Heritage Data Query Procedures Tech Note No. 10: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/biology_10_hawaii_natural_heritage.doc • Client interview • US Fish and Wildlife Service county endangered species lists: http://endangered.fws.gov/wildlife.html#Species • Fish and wildlife recovery plans • Consultation with appropriate federal, state, and local agencies/groups • Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 9 Hawaii Stream Visual Assessment Protocol, No. 11 birds of North America and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology	Non Measurable	Non measurable
Fish and Wildlife – Threatened and Endangered Species: Declining Species, Species of Concern	The site includes individuals, habitat or potential habitat for one or more fish or wildlife species that the State or Tribal government with jurisdiction, or the State Technical Committee, has identified as a species of concern. This includes fish and wildlife species that have been identified as candidates for listing under the Endangered Species Act.	Same as National: Populations and/or habitats of fish and wildlife species of concern are managed to maintain, increase, or improve current populations, health, or sustainability.	• Inventory of presence/absence of T&E species (Hawaii Natural Heritage Data Query Procedures Tech Note No. 10: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology/biology_10_hawaii_natural_heritage.doc • Client interview • US Fish and Wildlife Service county endangered species lists: http://endangered.fws.gov/wildlife.html#Species • Fish and wildlife recovery plans • Consultation with appropriate federal, state, and local agencies/groups • Hawaii Wildlife Habitat Evaluation Guides: Hawaii Biology Tech Notes: No. 2 Native Aquatic Wildlife Inventory Worksheet, No. 5 Native Forest Bird Inventory Worksheet, No. 9 Hawaii Stream Visual Assessment Protocol, No. 11 birds of North America and No. 13 Critical Habitat Tables with Primary Constituents: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/biology	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Domestic Animals – Inadequate Quantities and Quality of Feed and Forage	Total feed and forage are insufficient to meet the nutritional and production needs of the kinds and classes of livestock.	Same as National: Feed and forage, including supplemental nutritional requirements, are provided to meet production goals for the kinds and classes of livestock. Native grazers are factored into the total feed and forage balance computations.	• Prescribed Grazing HI-RANGE-3, Hawaii Range Feed, Forage and Livestock Balance Worksheet available online in FOTG Section IV: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=HI • National Range and Pasture Handbook: http://www.glti.nrcs.usda.gov/technical/publications/nrph.html • Grazing Lands Application (GLA) software: http://www.glti.nrcs.usda.gov/technical/) • Nutritional Balance Program (NUTBAL) (Technical support document: ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/nutbal-tech-support.pdf • NIRS/Nutritional Balance Profile Program (NUTBAL Pro): http://www.glti.nrcs.usda.gov/technical/software/ • Forage quality laboratory analysis • Visual assessment (Body Condition Score) • Client interview	Non Measurable	Non Measurable
Domestic Animals – Inadequate Shelter	Livestock are not protected sufficiently to meet the production goals for the kinds and classes of livestock.	Same as National: Artificial and/or natural shelter is provided to meet production goals for the kinds and classes of livestock.	• Visual assessment • Client interview • Inventory of facilities and their capacities • National Range and Pasture Handbook: http://www.glti.nrcs.usda.gov/technical/publications/nrph.html	Non Measurable	Non Measurable

Hawaii Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**Hawaii Quality Criteria**	**Quality Criteria Assessment Tools**	**Measurement Units**	**Measurement Tool**
ANIMALS					
Domestic Animals – Inadequate Stock Water	The quantity, quality and distribution of drinking water are insufficient to meet the production goals for the kinds and classes of livestock.	Same as National: Sufficient water of acceptable quality is provided and adequately distributed to meet production goals for the kinds and classes of livestock. To reduce potential for water contamination, watering facilities are constructed or modified to minimize mortality to wildlife.	• Visual assessment • Client interview • Inventory of distribution needs • National Range and Pasture Handbook: http://www.glti.nrcs.usda.gov/technical/publications/nrph.html • Hawaii Stockwater Handbook	Non Measurable	Non measurable
Domestic Animals – Stress and Mortality	Animals exhibit illness or death from disease, parasites, insects, poisonous plants, or other factors.	Same as National: Land and water use and management are consistent with activities conducted to alleviate stress and mortality factors.	• Client interview • Visual assessment • Animal health/mortality alerts • State and local biosecurity protocols • State and local standards for animal disposal • Consultation with appropriate federal, state, and local agencies/groups	Non Measurable	Non Measurable
Water Quality – Colorado River Excessive Salinity *(Not applicable in Hawaii.)*	Colorado River Basin Salinity Control Program (CRBSC) tracks effects of improved irrigation techniques to reduce salt entering Colorado River waters that eventually flow into Mexico.	Not applicable on a National basis.	Not applicable	Tons/Acre/ Year unit – average annual tons of salt entering Colorado River waters reduced per acre for the field or planning area/unit	Not applicable