

R6 AMENDMENT 2209.21-2003-1

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FSH 2209.21 – RANGELAND ECOSYSTEM ANALYSIS AND MONITORING HANDBOOK
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01 - AUTHORITY

Rangeland monitoring and analysis is conducted on a Nation-wide basis under the guidelines provided in the Forest Service Manual (FSM), chapter 2210, Forest Service Handbook 2209.13, chapter 90, under the authority of the National Forest Management Act of 1976, and the Public Rangelands Improvement Act of 1978. These instructions and guides are written under the authority vested in the Regional Forester by FSM 2204.2, 2210.4, and 2212.04.

Rangeland analysis should be accomplished on rangelands in the National Forest System whether they are grazed by livestock or not. A minimum requirement, however, is for active allotments.

02 - OBJECTIVES

This Handbook provides directions for conducting rangeland monitoring and analysis in the Pacific Northwest Region of the Forest Service. Planning direction, formerly included in this manual, is now covered in FSM 2290.

The document includes direction shaping rangeland monitoring and analysis, as well as allotment management planning. It also provides permittees, Forest Officers, cooperating Agencies, Tribes, and the public an opportunity for mutual understanding of rangelands. The intensity and accuracy of the studies made on rangelands will vary depending on the need for information and the land management and/or allotment objectives.

The purpose of rangeland monitoring and analysis is to provide for informed decisions regarding land management, part of the planning process on Federally-administered lands. Monitoring is critical for adaptive management and ensuring viable ecosystems.

This is intended primarily as a handbook for monitoring range vegetation. For soils and water monitoring, refer to the appropriate Forest Service direction and handbooks.

03 - RESPONSIBILITIES

Forest Supervisors.

Forest Supervisors may supplement this Handbook after the proposed supplement has had peer and scientific review; or if the material or methods are taken from cooperating Agency or Interagency Handbooks, and the material has been reviewed and approved by the Regional Office Natural Resources Staff.

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Forest Supervisors, District Rangers and their staffs are responsible for encouraging permittees and other interested parties' understanding and participation in rangeland analysis and monitoring.

04– IMPLEMENTATION AND TRAINING

Funding. For a successful range monitoring program, funding must be stable and consistent. Recognizing budget constraints, it is far better to have a modest amount of consistent funding than budget levels that oscillate wildly from year to year. NFIM and NFVW are the most appropriate fund codes to support range monitoring.

Sophisticated monitoring plans are of little use if they are not funded. We therefore recommend a heavy reliance on remote sensing and vegetation mapping to monitor landscape changes over time.

Organize ground monitoring using the Table on p. 8 of Chapter 20. Monitoring should be appropriate to the questions asked and the appropriate scale. Care should be taken to efficiently answer monitoring questions. Avoid duplication of effort and incompatible datasets.

Partnering with other agencies and organizations is encouraged. Avoid proprietary methods, however. All range monitoring methods used on Federally-administered land, as well as associated data, should remain in the public domain.

Training. Regional and key Forest personnel should provide a three-day training in handbook methods annually, preferably in late winter or early spring. Such training will promote consistency and serve as a venue to answer questions and introduce new material.

Training Course Elements. The following training elements are recommended for a three-day course:

1. Specific objectives of the session.
2. The role of remote sensing and vegetation mapping in monitoring.
3. Landscape monitoring approaches
4. Mid-scale monitoring approaches, both terrestrial and riparian.
5. Fine scale (allotment) monitoring approaches, both terrestrial and riparian.
6. Long term monitoring: establishing permanent plots and photo points.

Accountability. A detailed program of work should be jointly agreed on by the Regional range management program manager and the staff officers of the Forests involved.

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Multi-Forest/subregional efforts are encouraged to provide efficiency and standardize efforts. Funding in subsequent years should be based on completion of the current program of work in a timely manner.

Integration. Integrating training with other efforts, such as FRCC, FIREMON, SAGEMAP, etc. is strongly encouraged. For example, fire regime condition class (FRCC) training can provide much of the landscape-scale monitoring necessary in a range monitoring plan. Adding a day of more site- or allotment-specific range monitoring training to a landscape-scale training is an efficient and cost-effective approach.

05 – GLOSSARY

The glossary applies throughout this handbook.

Abundance. The total number of individuals of a species in an area, population, or community (SRM 1999).

Accelerated erosion. Erosion in excess of natural rates, usually as a result of human activities (SSSA 1997).

Age classes: The distribution of different ages of the same species or group of species on a site.

Allotment Management Plan. A long term operating plan which is the implementing document for the decision made through the National Environmental policy Act process that promotes progress toward desired future conditions.

Allowable Use. The degree of utilization considered desirable and attainable on various specific parts of an allotment considering the present nature and condition of the resource, management objectives, and level of management.

Animal Unit. Considered to be one mature dry cow of approximately 1000 pounds based upon an average daily forage consumption of 26 pounds dry matter per day. (Abbr. A.U.)

Animal Unit Month. (1) The amount of dry forage required by a 1000 pound dry cow for one month. Not synonymous with head month.

Annual Plant: A plant completing its life cycle and dying in one year or less (SRM 1999).

Annual Production. The net quantity of aboveground organic material produced within a year. The same as net aboveground primary production.

Apparent Trend. An estimate of trend drawn from the presence or absence of indicators noted or measured during a one-time observation.

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Conclusion drawn from such a method can be borne out or refuted only by making additional observations or measurements over time. Apparent trend is described in the same terms as measured trend except that when no trend is apparent it shall be described as "not apparent."

Assessment. The process of estimating or judging the value or functional status of ecological processes (e.g., rangeland health) in a location during a moment in time.

At risk: Rangelands with a reversible loss in productive capability and increased vulnerability to irreversible degradation based upon an evaluation of current soil conditions and ecological processes (NRC 1994). At risk designation may point out the need for additional information needed to better quantify the functional status of an attribute.

Attribute: One of the three components---soil/site stability, hydrologic function, and integrity of the biotic community—that collectively define rangeland health.

Bare Soil. All land surface not covered by vegetation, rock, or litter (SRM 1999). As used in this document, visible biological crusts and standing dead vegetation are included in cover estimates as a type of vegetation and therefore are not bare soil or bare ground.

Bare Ground. The combination of bare soil, erosion pavement, and/or surface rock.

Basal area (plants): The cross-sectional area of the stem or stems of a plant or of all plants in a stand. Herbaceous and small woody plants are measured at or near the ground level; larger woody plants are measured at breast or other designated height. Synonymous with basal area (SRM 1999).

Benchmark. (1) A permanent reference point. (2) In range monitoring, it is used as a point where changes in vegetation through time are measured.

Biological crust: Microorganisms (e.g., lichens, algae, cyanobacteria, microfungi) and non-vascular plants (e.g., mosses, lichens) that grow on or just below the soil surface.

Biomass (plants): The total amount of living plants above and below ground in an area at a given time (SRM 1999).

Biotic integrity: Synonymous with “integrity of biotic community”

Blowout: An excavation in areas of loose soil, usually sand, produced by wind; a breakthrough or rupture of a soil surface attributable to hydraulic pressure, usually associated with sand boils (SRM 1999).

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Browse. That part of shrubs, woody vines, and trees available for animal consumption from plants which are palatable to wildlife and/or domestic animals.

Bunch grass: A grass having the characteristic growth habit of forming a bunch; lacking stolons or rhizomes (SRM 1999).

Canopy Cover. The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. The sum of canopy cover of several species may exceed 100 percent. (Syn. crown cover).

Capability. The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease. (36CFR 219.3) [as cited in FSM 1905] Used as a NEPA planning tool at a Forest level, and no longer as a range management tool.

Carrying Capacity. The maximum number of animals that can be grazed on a land unit for a specific period of time without inducing damage to vegetation or related resources. It may vary from year-to-year on the same area due to fluctuating forage production. (Syn. grazing capacity.)

Chemical soil crust: A soil-surface layer, ranging in thickness from a few millimeters to a few centimeters, that is formed when chemical compounds become concentrated on the soil surface. They can reduce infiltration and increase overland water flow similar to physical crusts. They are usually identified by a white color on the soil surface.

Class of Livestock. Age and/or group of a kind of livestock.

Community type. An aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers. A unit of vegetation within a classification.

Composition. The proportions of various plant taxa in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

Conservation Threshold. A transitional boundary where a rangeland attribute is at risk of losing basic functionality defined by a decrease in soil protection that could cause an increase in soil erosion, and a loss of site vegetative (species and/or canopy cover) sustainability. Crossing this threshold could result in a new ecological state.

Coordinated Resource Management (CRM). The process whereby various user groups are involved in discussion of alternative resource uses and collectively diagnose management problems, establish goals and objectives, and evaluate multiple use resource management.

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Cover, Percent. The area covered by the combined aerial parts of plants and vegetative ground cover expressed as a percent of the total area.

Cover Type. A classification unit of existing vegetation based on the dominant species. Follow Forest Service National and Regional standards in assigning cover types.

Critical Area. A portion of rangeland which has a critical issue related to it, such as a threatened or endangered or sensitive species, a high use recreation area, or a key wildlife habitat. The area serves as a monitoring and evaluation site for the critical issue.

Cryptogam. A plant in any of the groups Thallophytes, Bryophytes, and Pteridophytes--mosses, lichens, and ferns.

Density. Numbers of individuals or stems per unit area. (Density does not equate to any kind of cover measurement.)

Desirable Plant Species. Species contributing to management objectives.

Desired Future Condition -Rangelands. The specific future condition of rangeland resources that meets management objectives as identified in the Forest Plan and Allotment Management Plan. Desired future condition of rangelands can be expressed in terms of ecological status of the vegetation (e.g., departure from the historic or natural range of variability); it could include species composition, diversity of habitats, or age classes of species; desired soil protection, including conditions of soil cover, erosion, compaction, and loss of soil productivity; in riparian areas, it includes conditions of stream bank and channel stability, stream habitat, streamside vegetation, stream sedimentation, and water quality.

Desired Plant Community. A plant community which produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the Forest Land Management Plan or Allotment Management Plan objectives established for an ecological type(s). The desired plant community must be consistent with the type's capability to produce the desired vegetation through management, land treatment, or a combination of the two. The desired plant community must conserve to the extent practicable the long-term potential of the site to produce vegetation, and produce in the short-term those combinations of desired goods and services.

Ecological Keys. Keys used to show the relationship among plant community types and their ecological status in an ecological type. A key groups the community types within an ecological type. Community types are correlated to a status or seral stage.

Ecological Site. A specific location on the land that is representative of an ecological type.

Ecological Status. The degree of similarity between the existing vegetation (all components and their characteristics) and existing soil conditions compared to the

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potential natural community and the desired soil condition on a site. Synonymous with successional status.

Ecological Type. An ecological type is a category of land with a distinctive (i.e., it can be mapped) combination of landscape elements. The elements making up an ecological type are climate, geology, geomorphology, soils, and potential natural. Ecological types differ from one another ecological types in their ability to produce vegetation and respond to management and natural disturbances (Winthers et al. 2003).

Ecological units. Map units designed to identify land and water areas at different levels of resolution based on similar capabilities and potentials for response to management and natural disturbance. These capabilities and potentials derive from multiple elements: climate, geomorphology, geology, soils, water, and potential natural vegetation. Ecological units should, by design, be rather stable. They may, however, be refined or updated as better information becomes available (Winthers et al. 2003).

Erosion Pavement. A concentration of gravel or coarser fragments (1/8 inch to 3/4 inch) that remains on the soil surface after finer particles have been removed by running water or wind. Erosion pavement is not considered ground cover.

Forage. All browse and herbaceous foods that are available to grazing animals. It may be grazed or harvested for feeding.

Forb. Any herbaceous plant other than those in the Gramineae (or Poaceae), Cyperaceae, and Juncaceae families.

Frequency. A quantitative expression of the presence or absence of individuals of a species in a population.

Functioning Rangelands. A condition where a rangeland has the capability across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resilience. The full range of states and transitions, within the constraints of the current climatic regime, can be supported.

Functioning-at-Risk. Rangelands that have a reversible loss in capability and increased vulnerability to irreversible degradation based upon evaluation of current conditions and processes.

Grass. A member of the family Poaceae (formerly Gramineae).

Grass like Plant. A plant of the Cyperaceae or Juncaceae families which vegetatively resembles a true grass of the Gramineae family.

Grazing System. A specialization of grazing management which defines systematically recurring periods of grazing and deferment for two or more pastures or management units. (cf. deferred grazing, intermittent grazing, deferred-rotation grazing, and short-duration grazing.)

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Grazing Formula. The specific order of grazing or sequence within a grazing system.

Green Line. The first perennial vegetation from the water's edge. Riparian areas that are in high seral status with stable stream banks will exhibit a continuous line of vegetation at the bank full discharge level. Rocky stream types may have a significant amount of rock causing breaks in the vegetation. This rock is considered part of the green line. Other breaks may occur in the first perennial band of vegetation (watercourses or bare ground). The amounts of these (perennial vegetation, rock, and bare ground) should be recorded.

Ground Cover. The percentage of material, other than bare soil, covering the land surface. It may include live vegetation, standing dead vegetation, litter, cobble, gravel, stones and bedrock. Ground cover plus bare soil would total 100 percent.

Half-Shrub. A perennial plant with a woody base whose annually produced stems die each year.

Head Month. A month's use and occupancy of range by one animal over 6 months of age with disregard for offspring and daily feed or forage requirements. (Abbr. H.M.) Not synonymous with animal unit month.

Healthy Rangelands. Functioning rangelands that meet current and future needs of people for desired levels of values, uses, products, and services.

Herb. Any flowering plant except those developing persistent woody stems above ground.

Herbage. Herbs taken collectively.

Historic Range of Variability (HRV). The variability and central tendencies of biophysical, disturbance, and climatic systems, across landscapes and through time, in the absence of modern human interference. The reference time period is associated with historic climate, and can vary throughout the country. In the Pacific Northwest, the 400 years prior to 1850 (the approximate point of significant European settlement) is typically used as the reference time period (Quigley et al. 1997).

Historic Vegetation. The vegetation characteristic prior to European settlement (in the Pacific Northwest, about 1850). A period of time should also be specified, e.g., the 400 years prior to 1850, or 1450-1850.

Interpreting Indicators of Rangeland Health. A method for assessing upland areas for departure from sustainability at the local scale. See Chapter 20 for more details.

Indicator Species. (1) Species that indicate the presence of certain environmental conditions, seral stages, and/or previous treatment. (2) One or more plant or animal species selected to indicate a certain level of use.

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Interdisciplinary Team. A group of individuals from different resource disciplines assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. The members of the team proceed to solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions. This is different from a multidisciplinary team where each specialist is assigned a portion of the problem and their partial solutions are linked together at the end to provide the final solution.

Key Area. A relatively small portion of rangeland which because of its location, grazing or browsing value, and/or use, serves as a monitoring and evaluation site. (A key area guides the general management of the entire area of which it is a part, and will reflect the overall acceptability of current grazing management over the range.)

Key Species. (1) Forage species whose use serves as an indicator to the degree of use of associated species. (2) Those species which must, because of their importance, be considered in the management program.

Landform. Any physical, recognizable form or feature of the earth's surface having a characteristic shape and produced by natural causes.

Litter. The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

Monitoring. The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.

Natural Range of Variability (NRV). The variability and central tendencies of biophysical, disturbance, and climatic systems, across landscapes and through time, in the absence of modern human interference (Hann et al. 2005)

Non-functioning Rangeland. A condition where a rangeland has lost the capability across the landscape for ecological resilience. Non-functioning rangeland health occurs when the desired condition is not being met and short-term objectives are not being achieved to move the rangeland toward the desired conditions.

Objective. A clear and quantifiable statement of planned results to be achieved within a stated time period. Something aimed at or striven for within a predetermined time period. An objective must: be achievable, be measurable, have a stated time period for completion, be quantifiable, be clear, and its results must be described.

Overstory. The upper canopy or canopies of plants. Usually refers to trees, tall shrubs, and vines.

Palatability. The degree of attractiveness of a plant to animals as forage.

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Pedestalled Plants. Plants which are growing on a hummock of soil as a result of water or wind erosion removing the soil from the interspaces between plants. In some situations, this may also occur from frost heaving.

Percent Use. The percentage of current year's forage production that is consumed or destroyed by grazing animals. May refer to a single species or to the vegetation as a whole.

Phenology. The study of periodic biological phenomenon, such as flowering, seeding, etc., especially as related to climate.

Photo point. An identified point from which photographs are taken at periodic intervals. Synonymous with camera point.

Plant Community. An assemblage of populations of plants in a common spatial arrangement.

Plant Vigor. Plant health. (cf. plant vigor index.)

Potential Natural Community (PNC). The biotic community that would become established on an ecological type if all successional sequences were completed without interference by man under the present environmental conditions. Natural disturbances, such as drought, floods, wildfire, grazing by native fauna, insects, and disease, are inherent in its development. The PNC may include acclimatized or naturalized non-native species.

Proper Functioning Condition. Used in riparian areas, this is a qualitative assessment method for determining whether the ecosystem is operating within sustainable bounds. See Chapter 20 for more details.

Proper Use Criteria. The limiting factor or factors which will be measured on a particular site. It could be percent utilization of forage, impact on other resources or uses, or any other measurable factor on a particular site.

Range Analysis. Systematic acquisition and evaluation of rangeland resources data needed for planning allotment management and overall land management.

Range Condition. The state of vegetation, soil cover, and soils in relation to a standard or ideal for a particular ecological type. (See satisfactory range and unsatisfactory range condition.)

Range Inspection. A field inspection of rangeland to determine if the Forest Plan Standards and Guides, the Allotment Management Plan Goals and Objectives, and the Grazing Permit requirements are being met and followed.

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Rangeland. All land-producing or capable-of-producing native forage for grazing and browsing animals, and lands that have been revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. It includes all grasslands, shrublands, and those forest lands which will continually or periodically, naturally or through management, support an understory of herbaceous or shrubby vegetation that provides forage for grazing or browsing animals.

Rangeland Administrative Decision. See FSH 2209.13, section 16.2.

Rangeland Management Unit. A land area specifically designated for management as an allotment or Wild Horse and Burro Territory.

Rangeland Project Decision. A project level NEPA decision. Refer to FSH 2209.13, section 93.

Range Site. Synonymous with ecological site when applied to rangeland.

Relict (Relic) Area. A remnant or fragment of a flora that remains from a former period when it was more widely distributed.

Research Natural Area. Part of a national network of reserved areas that include protected areas representative of the full array of North American ecosystems; biological communities, habitats, phenomena, and geological and hydrological formations and conditions.

Resource Value. The value of an ecosystem for a particular use or benefit on an ecological type. This value may be expressed as the value amount or as a relative rating, when compared to the maximum value for an ecological type.

Resource Value Rating (RVR). A rating of the value of vegetation present on an ecological type for particular use or benefit. RVRs may be established for each plant community capable of being produced in an ecological type, including exotic or cultivated species.

Riparian Area. Geographically delineable areas with distinctive resource values and characteristics that are comprised of the aquatic and riparian ecosystems. Riparian areas may be associated with lakes, reservoirs, estuaries, potholes, springs, bogs, wet meadows, muskegs, and ephemeral, intermittent, or perennial streams.

Riparian Community Type. A repeating, classified, defined, and recognizable assemblage of riparian plant species.

Riparian Complex. A repeating, classified, defined, and recognizable assemblage of riparian community types.

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Riparian Ecosystem. A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem and is identified by soil characteristics and distinctive vegetation communities that require full or unbound water.

Rotation Grazing. A grazing scheme where animals are moved from one grazing unit in the same group of grazing units to another without regard to specific graze-rest periods or levels of plant defoliation.

Satisfactory Condition. When the desired future rangeland condition is being met or short term objectives are being achieved to move the rangeland toward the desired future condition.

Sensitive Species. Those plants and animals identified by the Regional Forester for which population viability is a concern, as evidenced by 1) a significant current or predicted downward trends in population numbers or density, or 2) a significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Seral Stage. The relatively transitory communities which develop under ecological succession. (synonymous with seral communities).

Shrub. A plant that has persistent, woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature and non-arborescent form.

Species Composition. The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, or weight. (syn. Composition).

Succession, Plant. The unidirectional change in species proportions of a stand or the complete replacement of one community by another. It is the process of species establishment, development, and replacement within a community. Primary succession is the change that occurs on a surface recently bared by physiographic processes such as glacial retreat. After colonization and vegetation development of such sites, subsequent disturbance initiates a sequence of vegetation change defined as secondary succession. In secondary successional seres, change is initiated by disturbance agents (such as fire, insects, wind, and flooding) that affect existing vegetation.

Suitability. The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. (FSM 1905) Used as a NEPA planning tool at the Forest level, and no longer as a range management tool.

Sustainable Rangelands. The ability of rangelands to maintain its composition, biodiversity, structure, fertility, and functions over time under the current climatic regime. Functioning rangelands are sustainable.

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Transitory Range. Rangelands that exist with forests are often termed *transitory ranges* as they exist for a time period after a disturbance event such as wildfire, and give way as recolonizing trees gain dominance (Vavra 2000).

Trend. The direction of change in an attribute as observed over time. The change in direction could be in ecological status; resource value rating; or a vegetative, ground cover, or soil feature over time. Trend should be described as “meeting,” “moving toward,” or “not meeting” a particular attribute of a desired plant community. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological status.

Unsatisfactory Range Condition. Unsatisfactory rangeland condition is when the desired future rangeland condition is not being met and short term objectives are not being achieved to move the rangeland toward the desired future condition. (cf. satisfactory range condition.)

Vigor. The relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

06 -GENERAL INSTRUCTIONS

Rangeland monitoring and analysis is the systematic evaluation of rangeland resource data. Monitoring facilitates the determination of desired conditions of rangelands and the achievement of management decisions. Analysis consists of identifying and mapping rangeland vegetation and possibly other resources, and determining rangeland health (sec. 22) and sustainability to provide information to support rangeland project decisions. This information is used in overall rangeland sustainability planning and in making rangeland project decisions on rangeland management units and wildlife critical ranges.

The National Forest Management Act and the implementing regulations identify certain information needs concerning National Forest System rangeland. This information is collected through rangeland monitoring and is analyzed and discussed through environmental analysis and resulting decisions.

Other information needs may include:

1. Assess the landscape of interest, typically at National Forest scale, to determine the mix of vegetation types, their seral stages, and departure from the historic range of

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variability (HRV) or desired condition.

2. Monitor rangeland annually for grazing administration and periodically for long term trend based resource objectives.
3. Identify rangelands that are functioning at risk or non-functioning in relation to desired objectives with appropriate action for their restoration.
4. Identify rangeland management prescriptions to meet desired conditions.
5. Tie range status monitoring to trend monitoring using procedures described in the chapters that follow.
6. Identify land treatment and vegetation manipulation practices.
7. Evaluate pest and invasive species problems and prescribe rangeland best management practices to prevent, eliminate, reduce, or control them.
8. Evaluate possible conflict or beneficial interactions among livestock, wild free-roaming horses and burros, wild animal populations, and rare plant populations.
9. Determine action to be taken for rehabilitation of rangelands in unsatisfactory rangeland condition.
10. Monitor riparian zones within or adjacent to rangelands to determine effects of grazing on their structure, function, and composition, in accordance with prevailing legal, planning, and State Water Quality Standards direction.

Collect the information needed for an analysis and synthesis of the issues associated with the management of the rangelands for rangeland project decisions and Forest Land and Resource Management Plan requirements.

Data collection and analysis should be in accord with national and regional existing vegetation mapping standards. Data collection should be organized to facilitate data entry into NRIS Terra.

In range analysis and monitoring activities, encourage cooperation among the District Ranger and District staff, ID team members, the grazing permittee, and rangeland management interest groups. The Ranger and/or the District Resource Assistant should participate to the extent that they become familiar with the techniques and results of the analysis.

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The analysis and monitoring results are used in developing or modifying Forest planning and rangeland project decisions. Direction for Rangeland Management Project Decisions, ties to Forest Planning, and determining rangelands administered to standard is found in FSH 2209.13, chapter 90, Grazing Permit Administration Handbook, Rangeland Management Decision Making in the Forest Service.