

# Developing and using Cooperative Monitoring for Adaptive Management and NEPA

## What is *Required* for NEPA for Grazing Permits?

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*The “requirements” are many with complex interrelated elements linked to monitoring and natural resource adaptive management.*

*This document provides a synopsis of select Grazing Permit administration and management requirements emphasizing monitoring, data collection, analyses, and cooperation found within multiple USDA FS edicts linked to or under NEPA law.*

**It is understood the term cooperation incorporates coordination, collaboration, consultation, communication, and transparency as defined in Executive orders and related edicts.**

- 1. Our NEPA obligations:** *A clear understanding of NEPA law is a critical starting point specific to the importance of monitoring, data collection, analyses, and cooperation.*

The National Environmental Policy Act (NEPA) of 1969 (16 U.S.C. 4321 et seq.). This act sets forth requirements to consider the environmental impact of proposed actions; identify adverse environmental effects which cannot be avoided; consider alternatives to the proposed action; consider the relationship between local short-term uses and long-term productivity; and identify any irreversible and irretrievable commitments of resources (FSM 1950).

Section 102 directs that all agencies of the Federal Government shall utilize a systematic, interdisciplinary approach to insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making, which may have an impact on the human environment. See Forest Service Handbook (FSH) 1909.14-Resource Inventory Handbook, and FSH 1909.15-National Environmental Policy Act Handbook, for Council on Environmental Quality (CEQ) regulations implementing NEPA. See 40 CFR sections 1502.3 and 1505.3 for regulations on monitoring decisions.

**Within NEPA, Congress requires** that other laws, regulations, and policies be interpreted and administered in accordance with the Act. This includes **edicts that require monitoring, data collection, analyses, and cooperation.** These edicts are closely linked, emphasizing statutory obligations. These obligations are further underscored with specific **regulatory or policy** language that denotes mandatory actions and accountability.

**NEPA, Sec. 2 [42 USC § 4321]. Purpose.** *To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to **promote efforts** which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to **enrich the understanding** of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.*

**Furthermore, a driving point is** that our efforts build a foundation in meeting the goals of the Nation through **evaluation of public land management.** This fosters and promotes environmental quality to meet conservation, social, economic, health, and other requirements of the Nation.

**NEPA, Sec. 204 [42 USC § 4344].**

As mandated within NEPA, the Council on Environmental Quality (CEQ) has a duty to –

- **gather timely and authoritative information** concerning the conditions and trends in the quality of the environment both current and prospective,
- to **analyze and interpret such information** for the purpose of determining whether such **conditions and trends** are interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act,
- and to **compile and submit** to the President **studies relating to such conditions and trends**;

Furthermore, CEQ must –

- **conduct investigations, studies, surveys, research, and analyses** relating to ecological systems and environmental quality;
- **document and define changes** in the natural environment, **including the plant and animal systems**,
- and to **accumulate necessary data and other information for a continuing analysis** of these changes or trends and an interpretation of their underlying causes;
- **report** at least once each year to the President on the **state and condition** of the environment.

#### **NEPA, 42 USC § 4372**

**Monitoring is a key component of NEPA law.** The Director of the Office of Environmental Quality shall assist and advise the President on federal policies and programs affecting environmental quality by -

- Reviewing adequacy of **existing systems for monitoring and predicting environmental changes**;
- Promoting advancement of **scientific knowledge of the effects of actions**;
- Preventing or reducing **adverse effects** that endanger the health and well-being of man;
- **Coordinating** programs and **activities which affect, protect, and improve** environmental quality;
- **Collecting, collating, analyzing, and interpreting data and information** on environmental quality, ecological research, and evaluation.

The **government** as described within NEPA **must meet specific obligations** that *includes monitoring, data collection, analyses, and cooperation*. **Our efforts at the local level assist in the ability to meet these obligations to our nation by providing information for regional and national databases. Further, this information continues to be critical for local adaptive management of natural resources.**

## **2. Our NFMA obligations and actualities:**

National Forest Management Act of 1976 [NFMA] (P.L. 94-588, 90 Stat. 2949, as amended; 16 U.S.C. 472a, 476, 500, 513-516, 518, 521b, 528 (Note), 576b, 594-2 (Note), 1600 (Note), 1601 (Note), 1600-1602, 1604, 1606, 1608-1614). Sections two 2, 6(f)(3), and 6(g)(2), emphasize the stipulations of the Renewable Resources Planning Act of 1974. The Act also requires that the Forest Service **establish quantitative and qualitative standards and guidelines** for land and resource planning and management.

### **NFMA, Sec. 2. Findings**

*Various findings by Congress highlight the importance of cooperative monitoring, data collection, analyses, and adaptive management.*

- The management of the Nation's **renewable resources** is **highly complex**.
- **Uses, demand for, and supply of the various resources** are **subject to change over time**.
- **Public interest** is served by the Forest Service in cooperation with other agencies.

- The renewable resource program includes a **comprehensive assessment** of the supply of renewable resources.

**NFMA, Section 5.** Renewable Resource Program

Sect. 5. Section 4 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as redesignated by section 2 of this Act, emphasizes the requirement to "**implement and monitor.**"

**NFMA, Section 6.** National Forest System Resource Planning. Section 6 includes the following requirements:

- "(g) (2) (B) provide for **obtaining inventory data on the various renewable resources, and soil and water, including pertinent maps, graphic material, and explanatory aids...**"
- "(g) (3) (C) insure **research on and (based on continuous monitoring and assessment in the field) evaluation of the effects of each management system** to the end that it will not produce substantial and permanent impairment of the productivity of the land..."

**3. Our FLPMA obligations:**

Federal Land Policy and Management Act of 1976 (P.L. 94-579, 90 Stat. 2743, as amended; 43 U.S.C. 1701 (Note), 1701, 1702, 1712, 1714-1717, 1719, 1732b, 1740, 1744, 1745, 1751-1753, 1761, 1763-1771, 1781, 1782; 7 U.S.C. 1212a; 16 U.S.C. 478a, 1338a). This Act **requires that public lands and their resources be periodically and systematically inventoried**, and that an **evaluation of the current natural resource use and values be made** of adjacent public and nonpublic land.

Federal Land Policy Management Act (FLPMA) Sec. 402(d). This congressional statute mandates careful and considered consultation, cooperation and coordination with the lessees, permittees, and landowners. [ This should be accomplished throughout all aspects of forest and rangeland management, and in this case includes analysis efforts prior to and during proposal development. **This includes cooperative monitoring and data collection.**]

**Further obligations and responsibilities specific to cooperative monitoring, data collection, analyses, adaptive management and NEPA:**

4. **The Organic Administrative Act of 1897** – Although the founding legislation for the National Forests, this law also included provisions for **the inventory and monitoring** of these lands (Founding legislation of inventory and monitoring activities with the USDA Forest Service).
5. **McSweeney-McNary Forest Research Act of 1928 (P.L. 70-466)**. This is enabling legislation for **inventory, monitoring, and assessment** activities in the Forest Service (Founding legislation of inventory and monitoring activities with the USDA Forest Service).
6. **Fish and Wildlife Coordination Act of 1934 (Ch. 55, 48 Stat. 401, as amended; 16 U.S.C. 661, 662(a), 662(h), 663(c), 663(f))**. This Act authorizes **surveys and investigations** of the wildlife of the public domain lands including lands and waters of interest therein acquired or controlled by any agency of the United States.
7. **Fish and Wildlife Act, August 8, 1956 (P.L. 84-1024, Ch. 1036, 70 Stat 1119, 16. U.S.C. 742a, d, e, i and j)**. This Act authorizes the Secretary to conduct **investigations and prepare periodical reports** related to production and flow of fish to market and **biological requirements** of fish and wildlife resources.

8. **Multiple-Use Sustained-Yield Act of June 12, 1960. (16 U.S.C. 528-531; FMS 1021.2).**  
The Secretary of Agriculture is directed to **develop and administer the renewable surface resources** of the national forests for **multiple-use and sustained-yield of the several products and services** obtained there from, with due consideration to the **relative values of the various resources** in particular areas and without impairment of the productivity of the land.
  
9. **Wilderness Act of 1964 (P.L. 88-577, 78 Stat. 890; 16 U.S.C. 1121 (note), 1131-1136).**  
Section four of the Act requires each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area. **To comply requires agencies to monitor and inventory** wilderness attributes to identify and evaluate how selected actions and conditions related to wilderness character are changing. **Administering agencies are to monitor compliance** with the wilderness responsibility to preserve the wilderness character of an area designated as wilderness.
  
10. **Intergovernmental Cooperation Act of 1968**, as amended by the Intergovernmental Cooperation Act of September 13, 1982 (31 USC 6501-6508, Public Law 97-258). Title III of this Act authorizes the Forest Service to provide **special or technical services** to States or subdivisions of States.
  
11. **Environmental Quality Improvement Act of April 3, 1970, as amended (P.L. 91- 224, Title II; P.L. No. 97-258, September 13, 1982; and P.L. No. 98-581, October 30, 1984. 42 USC § 4372).** Section a...d(3) calls for **reviewing the adequacy of existing systems for monitoring and predicting environmental changes** in order to achieve effective coverage and efficient use of research facilities and other resources; and d(7) **calls for collecting, collating, analyzing, and interpreting data and information on environmental quality, ecological research, and evaluation.**
  
12. **Endangered Species Act of 1973 (ESA). (P.L. 93-205, 87 Stat. 884, as amended; 16 U.S.C. 1531-1536, 1538-1540).** This act charges Federal agencies to utilize their authorities to achieve the purposes of the ESA by carrying out programs and activities for the conservation of endangered and threatened species and the ecosystems upon which they depend, and **ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize** the continued existence of any endangered, threatened or proposed species, or result in the destruction or adverse modification of designated critical habitat [monitoring documents this information].
  
13. **Federal Noxious Weed Act of 1974 (January 3, 1975, P.L. 93-629, as amended, 81 Stat. 2148; 7 U.S.C. 2801 (note), 2801-2814).** This Act directs the **management of undesirable plants** on Federal lands, requiring Federal agencies to establish an undesirable plants management program. Departmental policy requires providing periodic land and aquatic resource inventories compatible among agencies to **identify and classify** noxious weeds and their infestations.
  
14. **The Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (P.L. 93-378)** – This act amended the earlier research legislation and directed the Secretary of Agriculture to: “...to make and keep current a **comprehensive inventory and analysis** of the present and prospective conditions of and requirements of **the forest and range lands** of the United States ...” This act also included specific language to include National Forest Systems in the **inventory and monitoring** effort and also added non-timber attributes.

This Act directs the Secretary of Agriculture to **periodically assess the national situation of the forest and rangeland resources**, and to submit to Congress, at regular intervals, recommendations for long-range Forest Service programs essential to meet future resource needs. This **assessment** is called the Forest and

Rangelands Renewable Resources Planning Act (RPA) assessment. The law requires a **comprehensive and appropriately detailed inventory** of all National Forest System lands and renewable resources be maintained on a continuing basis (section five).

15. **Soil and Water Conservation Act of 1977 (P.L. 95-192, 91 Stat. 1407; 16 U.S.C. 2001-2009)**. This Act authorizes the Secretary of Agriculture to obtain and maintain information of the current status of soil, water, and related resources. The Act further **requires an integrated system capable of using combinations of resource data to determine** the quality and capabilities for alternative uses of the resource base and to identify areas of local, State, and national concerns.
16. **Forest and Rangeland Renewable Resources Research Act of 1978 (P.L. 95-307, 92 Stat. 353, as amended; 16 U.S.C. 1600 (Note), 1641-1647)**. This Act **directs the Secretary of Agriculture to make and keep current a comprehensive survey and analysis of the conditions and requirements of the forests and rangelands of the United States.**
17. **Public Rangelands Improvement Act of 1978 (P.L. 95-514, 92 Stat. 1806; 43 U.S.C. 1752-1753, 1901-1908; 16 U.S.C. 1333(b))**. Section four **directs the Secretary of Agriculture to maintain a current inventory of range conditions and trends of rangeland conditions on the public rangelands.**
18. **Information Quality Act of 2001 obligations:**  
(Data Quality Act, P.L. 100-554, section 515). **Directs Federal agencies to ensure and maximize the quality, objectivity, utility, and integrity of information disseminated including statistical information,** to ensure the information is useful, clear, and sound.
19. **Executive Order 11991, (May 24, 1977) (Amended Executive Order 11514 of March 5, 1970)**. **Directs Federal agencies to monitor, evaluate, and control, on a continuing basis, their agencies' activities so as to protect and enhance the quality of the environment.**
20. **Executive Order 13352 – Facilitation of Cooperative Conservation ((69 FR 167, 52989, August 30, 2004)**. **Directs the Departments of the Interior, Agriculture, Commerce, Defense, and the Environmental Protection Agency, to implement laws relating to the environment and natural resources in a way that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision-making** in accordance with their respective agency missions, policies, and regulations.
21. **Title 36, Code of Federal Regulations, Section 200**. **Describes the agency functions towards which inventory, monitoring, and assessment activities are directed.**
22. **Title 36 CFR, Code of Federal Regulations, part 220 (36 CFR 220)** Forest Service NEPA Regulations supplement the CEQ regulations.  
  
...The EIS **must** disclose not only the effect of the action but also the effect of the adjustment. Such proposal or alternative **must also describe the monitoring** that would take place to inform the responsible official whether the action is having its intended effect. (36 CFR 220.5(e))
23. **Title 36, Code of Federal Regulations, Section 222**. **Requires analysis of range allotments and that such analyses occur jointly with affected individuals and groups.**

## **24. Title 40, Code of Federal Regulations, Sections 1500 through 1508.28:**

This regulation directs the Forest Service to **apply environmental analysis** to environmentally significant decision points during National Environmental Policy Act (NEPA) activities.

State whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. **A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation.** (40 CFR 1505.2)

Council on Environmental Quality (CEQ) Regulations: The regulations at Title 40, Code of Federal Regulations, parts 1500-1508 (40 CFR 1500-1508) set forth specific requirements for implementing the NEPA. The regulations establish procedures and rules governing **environmental analysis and documentation; ensure that environmental information is available** to public officials and the public, including identification of significant issues; and provide direction to assist public officials in making decisions based on an understanding of environmental consequences.

**[You must] provide for monitoring** to assure that decisions are carried out in important cases, and make sure mitigation measures are implemented (40 CFR 1505.3).

## **25. FSM 1906.21 - Project Planning**

Project-level plans describe on-the-ground projects and activities designed to achieve long-term objectives identified in the strategic plan and moving the planning area toward **desired conditions** or to meet public demand. **Most site-specific projects and activities are designed to meet the objectives of the land management plan while reflecting current local issues and needs.** Projects and activities are subject to the National Environmental Policy Act and other applicable laws and regulations. The level of required **environmental analysis and planning to carry out a project is dictated by the scope and complexity of the project, public issues, and the project's potential effects on the human environment.**

## **26. FSM 1940:**

Land management is an adaptive process that includes **social, economic, and ecological evaluations of conditions and trends** that contribute to sustaining social, economic, and ecological systems. The Forest Service is committed to **collaborating internally and with other land management partners** to provide highly credible resource information that meets a wide range of needs. **Credible information requires inventory, monitoring, and assessment activities that are appropriately standardized, consistent, and effective.**

### **FSM1940.2 - Objectives**

The objectives for **managing inventory, monitoring, and assessment activities** are to:

1. Provide the information necessary for achieving the agency's mission, goals, objectives, and business needs that fulfills information quality guidelines for objectivity, utility, and integrity; and
2. Support an adaptive land management process that includes social, economic, and ecological **evaluations.**
3. Obtain order, consistency, and efficiency across the agency.

### **FSM1940.3 - Policy**

Inventory, monitoring, and assessment activities **shall:**

3. **Foster and realize** opportunities for **collaboration, cooperation, and coordination** across Forest Service deputy area programs and **with agency partners, including the public; local, state, and other federal agencies; and non-governmental organizations.**

### 1940.43 - All Agency Line Officers

1. Ensure the goals, objectives, and needs of their programs and areas of responsibility are adequately addressed in the national integrated program planning process.
2. Provide the leadership and resources needed to implement the results of the national integrated program planning process.
3. Ensure the **standards-based** approach and **information management** framework is implemented in their programs and areas of responsibility.

## 27. **FSM 1950:**

This chapter sets forth Forest Service management objectives, policy, and responsibilities for meeting the requirements of the National Environmental Policy Act (NEPA).

**Environmental Policy and Procedures.** Prescribes **the assessment** and decision-making processes required by the NEPA and the statements and **reports necessary** to document project planning.

### NEPA objectives FSM 1950.2

1. Fully integrate NEPA requirements into agency planning and decisionmaking (36 CFR 220.4(c)(2))
2. Use a systematic, interdisciplinary approach to fully consider the impacts of Forest Service proposed actions on the physical, biological, social, and economic aspects of the human environment (40 CFR 1507.2(a), 40 CFR 1508.14)
3. Involve interested and affected agencies, state and local governments, tribes, Alaska Native corporations, organizations, and individuals in planning and decisionmaking (40 CFR 1500.1(b), 40 CFR 1500.2(b) and (d), 40 CFR 1501.7, 40 CFR 1503.1, 40 CFR 1506.6)
4. Conduct and document environmental analyses and subsequent decisions appropriately, efficiently, and cost effectively.

### FSM1950.3 - Policy

Compliance with NEPA is fundamental to managing all Forest Service resource, research, and cooperative forestry programs and must be integrated into the management processes of those programs.

### FSM 1950.41 13.

**Provide for monitoring** to assure that decisions are carried out in important cases, and make sure mitigation measures are implemented (40 CFR 1505.3).

## 28. **FSH1909.10:**

### FSH1909.10, 15.3

Cumulative effects analysis framework includes describing key assumptions made in an analysis and any information gaps that may exist. **Monitoring is a key component** in making this determination.

### FSH1909.10, 11.6

The responsible official should have **sufficient data** to determine the type of NEPA document that should be prepared.

### FSH1909.10, 12.3

Determine **information or data availability** and needs, and standards of accuracy commensurate to the acceptable level of risk and to the availability of qualitative and quantitative data.

### FSH1909.10, 13

#### Collect and Interpret Data

The type and amount of data to collect depend on the nature of the action, agency objectives, issues, and anticipated effects. **Focus data collection on the current and expected physical, biological, economic, and**

**social conditions affecting or affected by the proposed action.** Document the assumptions, analysis, methods, and data sources. If information is missing or incomplete, CEQ regulations provide guidance.

## 29. FSH1909.15:

The guidance in this handbook **must be used in conjunction with other direction** found throughout the Forest Service Manual (FSM) and Forest Service Handbooks (FSH). Specifically, use this handbook in conjunction with FSM 1950, Environmental Policy and Procedures, which sets forth the broad Forest Service objectives, policy, and responsibilities for meeting the requirements of the NEPA. Also, integrate the requirements in this handbook with the procedures set forth in FSM 1920 and FSH 1909.12 and the regulations implementing the National Forest Management Act (36 CFR part 219).

Specifically, this handbook provides guidance **for analyzing and documenting the environmental consequences of proposed actions.** Chapter 10 sets forth guidance on scoping and environmental analysis. Chapters 20, 30, and 40 contain the documentation and process guidance for environmental impact statements (EISs), categorical exclusions (CEs), and environmental assessments (EAs). **Chapter 50 addresses implementing and monitoring guidance** and chapter 60 provides references.

### FSH1909.15, 02 - OBJECTIVE

To conduct and document **environmental analyses** and the related decisions associated with national forest resource management, **cooperative forestry**, and research activities in a consistent way.

### FSH1909.15, 10 Environmental Analysis

#### FSH1909.15, 14.1 Adaptive Management Strategy

(also see FSH1909.15, 50 Implementation and Monitoring)

Alternatives may include an adaptive management strategy allowing for adjustment of the action during implementation. As stated in the Forest Service NEPA Procedures:

*The proposed action and one or more alternatives to the proposed action may include adaptive management. An adaptive management proposal or alternative **must clearly identify the adjustment(s) that may be made when monitoring during project implementation indicates** that the action is not having its intended effect, or is causing unintended and undesirable effects. The EIS [or EA] **must** disclose not only the effects of the proposed action or alternative but also the effect of the adjustment. Such proposal or alternative **must also describe the monitoring** that would take place to inform the responsible official during implementation whether the action is having its intended effect. (36 CFR 220.5(e)(2) and §220.7(b)(2)(iv))*

Adaptive management provides an implementation tool that goes beyond the “predict-mitigate-implement” model and incorporates an “**implement-monitor-adapt**” strategy that provides flexibility to account for inaccurate initial assumptions, to adapt to changes in environmental conditions or to respond to subsequent **monitoring information** that indicates that desired conditions are not being met.

When using adaptive management, display the proposed action as an initial management action and a collection of possible adjustments or acceptable tools to be used to modify the initial action to achieve the intended effects. Disclose the site-specific effects of all of these actions, adjustments, or use of acceptable tools in the **analysis along with the monitoring methods** to be used to determine the effectiveness of each. If **monitoring** demonstrates that the intended effects are not being achieved through the initial management action, the action can be modified using one or more of the identified adaptive management actions in a way that better achieves the intended effects.

So long as **monitoring** indicates that the environmental effects of each action do not exceed the bounds of those anticipated in the original decision and the actions serve to move the project toward the intended

effects, implementation continues using the “**implement-monitor-adapt**” cycle without the need for new or supplemental NEPA review.

#### **FSH1909.15, 11.6**

The responsible official **should have sufficient data** to determine if the proposed action can be categorically excluded from documentation in an EIS or an EA or, alternatively, to determine the type of document that should be prepared.

#### **FSH1909.15, 13 - COLLECT AND INTERPRET DATA**

The type and amount of data to collect depend on the nature of the action, agency objectives, issues, and anticipated effects. **Focus data collection on the current and expected physical, biological, economic, and social conditions affecting or affected by the proposed action.** Document the assumptions, analysis, methods, and data sources. See section 15.2 about setting boundaries for the effects analysis.

#### **FSH1909.15, 12.24 - Responsibilities When Applicants and Contractors are Involved**

Applicants. **The responsible official shall make policies or staff available to advise potential applicants of studies or other information foreseeably required** for acceptance of their applications. Upon acceptance of an application as provided by 36 CFR 251.54(g) the responsible official shall initiate the NEPA process. (36 CFR 220.4(i))

#### **Agency responsibility.**

(a) Information. If an agency requires an applicant to submit environmental information for possible use by the agency in preparing an environmental impact statement, then the agency should assist the applicant by outlining the types of information required. The **agency shall** independently evaluate the information submitted and **shall** be responsible for its accuracy. If the agency chooses to use the information submitted by the applicant in the environmental impact statement, either directly or by reference, then the names of the persons responsible for the independent evaluation shall be included in the list of preparers §1502.17. It is the intent of this paragraph that acceptable work not be redone, but that it be verified by the agency.

#### **FSH1909.15, 23.3**

...The EIS **must** disclose not only the effect of the action but also the effect of the adjustment. Such proposal or alternative **must** also describe the **monitoring** that would take place to inform the responsible official whether the action is having its intended effect. (36 CFR 220.5(e))

#### **FSH1909.15, 26.21**

**Alternatives considered.** All alternatives considered (including the no-action) should be briefly discussed with specific references to the EIS. **Mitigation measures, management requirements, and monitoring provisions that are pertinent to environmental concerns should be discussed with specific citations to pages of the EIS.**

State whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. **A monitoring and enforcement program must** be adopted and summarized where applicable for any mitigation 40 CFR 1505.

#### **FSH 1909.15, 50**

##### **NEPA, Implementation and Monitoring .**

This chapter focuses on **implementation and monitoring** guidance for decisions. Previous chapters provided guidance on the environmental analysis (ch. 10) and documentation (ch. 20, 30 and 40), with definitions in the zero code.

### **FSH 1909.15, 54 - MONITORING**

Agencies may provide for **monitoring** to assure that their decisions are carried out and should do so in important cases. Mitigation (40 CFR 1505.2(c)) and other conditions established in the environmental impact statement or during its review and committed as part of the decision shall be implemented by the lead agency or other appropriate consenting agency. The lead agency **shall:**

- (a) Include appropriate conditions in grants, permits or other approvals.
- (b) Condition funding of actions on mitigation.
- (c) Upon request, **inform cooperating or commenting agencies** on progress in carrying out mitigation measures which they have proposed and which were adopted by the agency making the decision.
- (d) Upon request, **make available to the public the results of relevant monitoring** (40 CFR 1505.3).

**In addition to complying with relevant monitoring requirements** of an existing Forest Land and Resource Management Plan (FSH 1909.12, sec. 12), **monitor actions to ensure** that:

- 1. Mitigation measures and terms and conditions of permits or other land use authorizations are met.
- 2. Anticipated results are achieved.
- 3. Necessary adjustments are made to achieve desired results.

### **FSH1909.15, 70**

#### **NEPA Oversight and Quality Assurance**

This chapter provides guidance for establishing, maintaining, and using the oversight and quality assurance framework to facilitate meeting agency NEPA analysis objectives, policies, and procedures (see FSM 1950). Performance indicators and measures have been developed as a separate tool, ([http://fsweb.wo.fs.fed.us/em/nepa/nepa\\_oqaf.htm](http://fsweb.wo.fs.fed.us/em/nepa/nepa_oqaf.htm)) to assist units and programs at all levels and branches of the Agency in assessing their NEPA program capacity, project management and efficiencies, document quality, legal compliance, and oversight responsibilities.

### **30. FSH2209.13, 90:**

#### **Grazing Permit Administration Handbook**

#### **Rangeland Management Decisionmaking**

(Discussion related to monitoring occurs over 100 times in this R3 directive, in the WO directive it occurs half that much)

### **FSH2209.13, 92.1**

#### **Plan-to-Project Analysis**

The Plan-to-Project analysis occurs prior to initiation of the formal National Environmental Policy Act (NEPA) analysis and documentation. Review may be needed should new information become available or if **effectiveness monitoring** indicates planned adaptive management needs to be altered from that which was analyzed.

It is through the Plan-to-Project analysis, conducted by an interdisciplinary team, in coordination with the permittee, that **desired conditions, existing conditions, and resource management objectives to address resource management needs are determined**. Possible management practices and information needs are also determined during the Plan-to-Project analysis. Possible management practices should address any and all practices to be addressed through an adaptive management strategy.

If **information needs** are identified, the deciding official must determine if gathering that information is necessary to make the decision or if the information can be accrued in conjunction with project implementation and adaptive management. The type of information needed as well as the determination of the necessity of the information should be well documented in the project record.

### **FSH2209.13,92.11**

#### Identification and Development of Desired Conditions

Desired conditions are fairly broad goals, which, should be determined and discussed in a specific, quantifiable and focused manner. Desired conditions should describe desired outcomes, not desired actions.

1. Develop project (site)-specific desired conditions through an interdisciplinary team process and **collaboration with stakeholders, including permittees.**
2. The Interdisciplinary Team **should** use the best available information and data, whether through formalized assessments, observations or anecdotal information. An explanation of information utilized and its usefulness **should** be documented in the project record.
3. Desired conditions **must** be **realistic/attainable and tied to site potential**, i.e. TES mapping and associated narratives, and/or ecological site descriptions.
4. Desired conditions **should** be specific enough to clearly apply to a **particular geographic location.**
5. Although desired conditions may be qualitative, they **should** describe environmental features in a way that allows for evaluation of progress towards the desired condition, so related management objectives can be monitored through established procedures.
6. Desired conditions **should** incorporate **natural variation by describing a range of appropriate conditions within the identified area rather than a single condition.**
7. Achievement of desired conditions **should** be those which can be addressed by livestock grazing practices, unless other types of management practices are to be employed.

### **FSH2209.13, 92.12**

#### Identification and Determination of Existing Condition

There are many sources to utilize when identifying existing conditions within a project area. Examples include allotment files, corporate databases, historic survey and monitoring data from varied disciplines, such as Threatened, Endangered, and Sensitive species, or Management Indicator Species, or soil condition surveys. Determine existing condition through inventory, sampling or documented observations.

1. Determine project (site)-specific existing conditions through an interdisciplinary team process and collaboration with stakeholders, including permittees.
2. The Interdisciplinary Team **should** use the best available information and data, whether through formalized assessments, observations, or anecdotal information. An explanation of information utilized and its usefulness **should** be documented in the project record.
3. Existing conditions **should** be specific enough to clearly apply to a **particular geographic location**, such as a map unit within a pasture.
4. Existing condition **analysis should** focus on determining cause and effect relationships between existing condition, past and present livestock management, but [ALSO]take into account other influences within the project area, such as disturbance from fire, roads, and wildlife.

### **FSH2209.13, 92.13**

#### Identification of Resource Management Needs

Resource management objectives should be described in terms which can be **monitored over time** to determine if management is being effective in moving existing condition towards desired condition. Whether the resource management objective is to change or maintain, the attributes which depict the condition should be described in **measurable terms.**

### **FSH2209.13,92.15**

#### Identification of Information Needs

In order to make project-level decision making more efficient, information needs should be identified 2-3 years in advance of project initiation.

### **FSH2209.13,92.21**

#### Decision Framework

A NEPA analysis must occur to continue to authorize livestock grazing. This shall be preceded by a plan-to-project analysis appropriate for the scale, scope, and any changed conditions of the landscape to determine if additional analysis and a new NEPA decision is needed.

### **FSH2209.13, 92.23**

#### Adaptive Management

Monitoring **should** answer the question “Is acceptable progress being made towards attainment of resource management objectives and thus desired conditions?” If the answer to this question is “yes” current management may continue. If the answer to this question is “no” various adaptive management adjustments may be initiated. The Responsible Official needs to ensure what the Agency proposes to do under adaptive management is **displayed and analyzed** in the NEPA analysis.

When monitoring indicates changes in management strategy should be considered, permittee ability to adjust management must be integral to the adaptive management strategy.

### **FSH2209.13, 95**

#### Monitoring

The need for monitoring **shall** be included in the project-level NEPA decision. Implementation and Effectiveness monitoring are both critical in determining when or if adaptive management changes **should** be made. Both types of monitoring are also critical to document the cause and effect relationships between management and movement towards resource management objectives. A monitoring plan which is part of the Allotment Management Plan specifies the likely monitoring protocols to be utilized. Monitoring protocols **shall** be defined during the formulation of desired conditions and resource management objectives. Monitoring is comprised of five key components: 1) the purpose for monitoring, 2) attributes to be monitored, 3) method selected to monitor those attributes, 4) the frequency which monitoring will be conducted and 5) the location, benchmark or key area where monitoring will take place. The purpose(s) for each monitoring activity **should** be well documented. Attributes to be monitored **should be tied to the resource management objectives documented in the NEPA based decision and AMP**. Methods **should** be appropriate to the attributes to be monitored. Frequency of monitoring **should** be appropriate to the potential changes desired to monitor. Short-term implementation monitoring often occurs on key areas. Long-term effectiveness monitoring often occurs on benchmarks. In many instances these areas are one in the same. In critical areas designated monitoring locations **must** be determined based on the purpose, attributes and appropriate methods, as well as changes to be monitored.

**Implementation monitoring may include such items as: actual use in each pasture, condition of range improvements, seasonal utilization, annual utilization, stubble heights, or any other annual monitoring which may be important or required.** Effectiveness monitoring **should** include attributes, locations and methods which will determine movement towards objectives. Implementation and effectiveness monitoring design **should be an open, cooperative, and inclusive process, which includes the Line Officer, ID Team, rangeland users and other interested parties**. This process **should** also determine priorities for monitoring, which may include federally listed species habitat, impaired streams, and areas critical to the livestock operation. The monitoring plan should be feasible to accomplish and should be consistent with Forest-wide monitoring goals. Both qualitative and quantitative monitoring can be of value. Qualitative monitoring, such as the Landscape Appearance Method or the Grazing Response Index, as well as photos can depict annual impacts. Long term qualitative monitoring, such as repeat photography can depict changes over time. Qualitative monitoring can be supplemental to quantitative monitoring.

**Quantitative monitoring for trend towards achievement of resource management objectives is the foundation for any adaptive management decision.** Each identified objective should have monitoring

which indicates the trend towards objectives. Monitoring should reflect the five components. It is important to remain consistent with monitoring methods and locations to assess changes. Should new methodologies become available, the ID Team needs to evaluate those methods for applicability based on monitoring objectives. It is important locations for monitoring also be maintained. Changes to either methods or locations should only occur after much thought and within the same open, cooperative, and inclusive process. Monitoring results need to be evaluated by the ID Team and Line Officer to determine if management is achieving resource management objectives. Based upon the evaluation of the results, adjustments in management may or may not be required. The evaluation and potential adjustment completes the Adaptive Management loop. It is also important to tie monitoring to the multiple uses to be provided by the landscape. For example, if a vegetative resource management objective is tied to particular wildlife species, it is important to determine if achieving the resource management objective is having the anticipated effects on the associated wildlife species.

Although the process of determining desired and existing conditions, developing resource management objectives, designing management practices and monitoring appears to be linear, in reality it is not. It is iterative and happens concurrently. Continual evaluation of management, through the adaptive management process, provides a framework for management which can address the complexities of responses within an ecosystem.

Procedures for rangeland assessment and monitoring are not limited to procedures in the current edition of the Rangeland Analysis and Management Training Guide. Other sources of information related to appropriate procedures for rangeland assessments and monitoring for application with the Southwestern Region include the following sources which are hereby incorporated by reference for use within the Southwestern Region.

#### Monitoring:

- Interagency Technical References (ITR) 1734-4 and 1734-3. Many of these methods are currently being developed electronically for storage in the NRIS database.
- Some Methods for Monitoring Rangelands, University of Arizona Extension Report # 9043 1997. Several of these methods are also in ITR 1734-4 and ITR 1734-3.
- Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems- USDA/ARS Jornada Experimental Range
- Monitoring the Vegetation Resources in Riparian Areas. Alma H. Winward. GTR – 47. 2000

#### Assessments:

- Rapid Assessment Methodology RITF Report # 58
- Interpreting Indicators of Rangeland Health TR 1734-6
- A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. TR 1737-15 1998
- Process for Assessing Proper Functioning Condition for Lentic Riparian – Wetland Areas. TR 1737-11 1994

#### References:

- Principles of Obtaining and Interpreting Utilization on Southwest Rangelands AZ1375 10/2005
- Principles of Obtaining and Interpreting Utilization Data on Rangelands AZ1375 05/2007.
- The Grazing Response Index: A Simple and Effective Method to Evaluate Grazing Impacts. *Rangelands* 21(4) 3-6,1999.

- Grazing Management Processes and Strategies for Riparian – Wetland Areas. TR 1737-20 2006
- Terrestrial Ecological Unit Inventory Technical Guide: Landscape and Land Unit Scales GTR Report WO-68. 2005.
- Existing Vegetation Classification and Mapping Technical Guide Version 1.0. GTR Report WO-67. 2005.
- Rangeland Management Before, During and After Drought AZ1136 07/1999.

### 31. **FSM1905, FSM1940.5 and FSH2209.13, 90:**

**FSM 1905, FSM1940.5, FSH2209.13, 90** – (obligations as found in term definitions)

**Activity, inventory, monitoring, and assessment. Organized dependent and independent tasks designed to achieve a specific purpose or objective within a defined period of time to inventory, monitor, or assess social, economic, ecological, and./or physical resources.**

Adaptive Management. An approach to natural resource management where actions are designed and executed and **effects are monitored for the purpose of learning and adjusting future management** actions, which improves the efficiency and responsiveness of management (36 CFR 219.16).

A system of management practices **based on clearly identified outcomes and monitoring** to determine if management actions are meeting desired outcomes, and if not, to facilitate management changes that will best ensure that outcomes are met or reevaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain (36 CFR 220.3).

Adaptive Management is a formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change, and improving management. See Figure 1 in FSH2209.13,90

Reference: Nyberg, J.B., Forest Practices Branch, BC Forest Service. An Introductory Guide to Adaptive Management For Project Leaders and Participants, January 1999.

Apparent Trend. An **interpretation of trend** based on observation and professional **judgment at a single point in time.\* An assessment**, using professional judgment, based on a one-time observation. It includes consideration of such factors as plant vigor, abundance of seedlings and young plants, accumulation or lack of plant residues on the soil surface, and soil surface characteristics (i.e. crusting, gravel pavement, pedestalled plants, and sheet or rill erosion). Interagency Technical Reference 1734-4

Assessment. An **analysis and interpretation** of the social, economic, or ecological **characteristics of an area using scientific principles to describe existing conditions** as they affect sustainability.

An analysis and interpretation of the social, economic, or ecological characteristics of an area using scientific principles to describe existing conditions as they affect sustainability. Assessments provide the foundation of independent information upon which to build conservation strategies and management decisions; and against which alternative approaches can be evaluated and modified.

Benchmark. A **permanent reference point, in range inventory and effectiveness (trend) monitoring**, it is used as a point where changes in vegetation, in response to applied management through time, are **measured**. Adapted from “A Glossary of Terms Used in Range Management.” Forth Edition, edited by the Glossary Update Task Group, Society for Range Management, Thomas E. Bedell, Chairman. 1998. Second Printing 2003.

Characteristics of Ecosystem Diversity. **Parameters that describe an ecosystem;** composition (major vegetation types, rare communities, aquatic systems, and riparian systems), structure (successional stages, water quality, wetlands, and floodplains), principal ecological processes (stream flows and historical and current disturbance regimes), and soil, water, and air resources.

Collaboration. People working together to **share knowledge and resources to describe and achieve desired conditions** for National Forest System (NFS) lands and for associated social, ecological, and economic systems in a plan area. Collaboration applies throughout land management, encompasses a wide range of external and internal relationships, and entails formal and informal processes.

Corporate Information. Corporate information provides the foundation for **consistent and effective information collection, analysis, storage, maintenance, and evaluation at multiple scales** for various reporting requirements and needs, including the Annual Performance and Accountability Report.

Enterprise-wide information management systems using a common information structure and processes to store, maintain and access shared automated inventory, monitoring, and assessment data.

Criteria and Indicators. Criteria are broad categories of conditions or processes by which the conservation and sustainable management of ecosystems and related resources may be assessed. **Indicators are measurable conditions for various aspects of a criterion.**

Desired Conditions: The **social, economic, and ecological attributes** toward which management of the land and resources of the plan area are to be directed. Desired conditions are aspirations and are not commitments or final decisions approving projects and activities, and may be achievable only over a long time period (36 CFR 219.7).

Desired Conditions. Descriptions of the social, economic and ecological attributes that characterize or exemplify the desired outcome of land management. They are aspirational and likely to vary both in time and space. Adapted from: Foundations of Forest Planning: Volume 1 (Version 2.0) Model of a Forest Plan. USDA Forest Service, January 2005

Ecological Conditions. Components of the **biological and physical environment** that can affect diversity of **plant and animal communities and the productive capacity of ecological systems.** These components could include the **abundance and distribution** of aquatic and terrestrial habitats, roads and other structural developments, human uses, and invasive, exotic species (36 CFR 219.16).

Ecological Site (ES) is a kind of land with **specific physical characteristics** which differs from other kinds of land in its **ability to produce distinctive kinds and amounts of vegetation** and its response to management.\* Also refer to the National Range and Pasture Handbook, USDA, Natural Resources Conservation Service, page 3.1.

Ecological Site Description (ESD) ESDs contain **information** about soil, physical features, climatic features, associated hydrologic features, plant communities possible on the site, plant community dynamics, annual **production estimates** and distribution of production throughout the year, associated animal communities, associated and similar sites, and interpretations for management. ESDs are **narratives and map units containing ecological sites.** Many ESDs also have State and Transition Models developed for them. Refer to the National Range and Pasture Handbook, USDA, Natural Resources Conservation Service, page 3.1-1.

Ecological Type is a category of lands with a **distinctive** (i.e., mappable) combination of **landscape elements.** The elements making up an ecological type are climate, geology, geomorphology, soils, and potential natural vegetation. Ecological types differ from each other in their **ability to produce**

**vegetation and respond to management and natural disturbances.** (Terrestrial Ecological Unit Inventory Technical Guide: Landscape and Land Unit Scales, USDA Forest Service, Gen Tech Report WO-68, 2005)

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 and potential natural vegetation. Ecological units should, by design, be rather stable. They may, however, be refined or **updated as better information becomes available.** (Terrestrial Ecological Unit Inventory Technical Guide: Landscape and Land Unit Scales, USDA Forest Service, Gen Tech Report WO-68, 2005)

Ecosystem Diversity. The variety and relative extent of ecosystem types, including **their composition, structure, and processes within all or a part of an area of analysis** (36 CFR 219.16).

Evaluation. An **appraisal and study** of social, economic, and **ecological conditions and trends** relevant to a unit. The **analysis of monitoring data that produces information needed to answer specific monitoring questions.** Evaluation may **include comparing monitoring results with a predetermined guideline or expected norm that may lead to recommendations for changes in management,** a land management plan, or monitoring plan. **Evaluations provide an updated compilation of information** for use in **environmental analysis** of future project and activity decisions.

Frequency (as a management tool) refers to **the number of times forage plants are defoliated** during the grazing period. Reed Floyd, Roy Roath, and Dave Bradford. 1999. The Grazing Response Index: A Simple and Effective Method to Evaluate Grazing Impacts. Rangelands 21(4): 3-6.

Frequency (as a measurement for trend) The ratio between the number of sample units that contain a species and the total number of sample units.\*

Grazing Intensity is **the degree of herbage removed** through grazing and trampling by livestock. Grazing intensity may be described in terms **herbage removed during the grazing and/or growing period** or as a **utilization level at the end of the growing period.** It is important to **clearly define how intensity** is being viewed and described. Removal of leaf material, when the plant is actively growing can affect root growth which in turn affects future leaf growth. Sufficient leaf area is essential to support plant functions through photosynthesis. Heavy to severe intensity or utilization can affect current plant development and growth, as well as growth during subsequent growing seasons.

Grazing Intensity is discussed by Holechek (Reference 1 below):

Light- Only choice plants are used. There is no use of poor forage plants. The range appears practically undisturbed.

Moderate- About ½ of the good and fair forage value plants are used. There is little evidence of livestock trailing and most of the accessible range shows some use.

Heavy- Range has a clipped or mowed appearance. Over half of the fair and poor value forage plants are used. All accessible parts of the range show use and key areas are closely cropped. They may appear stripped if grazing is very severe and there is evidence of livestock trailing to forage.

The above descriptions, may be especially helpful when **reviewing grazing during the growing season.**

Additional **qualitative assessment of grazing intensity** can be determined using the Landscape Appearance Method. It can be found in the Interagency Technical Reference 1734-3 Utilization Studies and Residual Measurements. Page 119.

Grazing Intensity as depicted as a **utilization level at the end of the growing season** as discussed by Holechek, (Reference 2 below):

Light to non-use	0-30 percent
Conservative	31-40 percent
Moderate	41-50 percent
Heavy	51-60 percent
Severe	61+ percent

References: (1) Holechek, Jerry L., Rex D. Pieper, and Carlton H. Herbel. 2004. Range Management, Principles & Practices. Prentice Hall, page 248.

(2) Holechek, Jerry L. and Dee Galt. 2000. Grazing Intensity Guidelines. Rangelands 22(3): 11-14.

An additional qualitative grazing assessment and planning tool is the Grazing Response Index (GRI). Reed Floyd, Roy Roath, and Dave Bradford. 1999. The Grazing Response Index: **A Simple and Effective Method to Evaluate Grazing Impacts**. Rangelands 21(4): 3-6.

Grazing Occurrence is **how often a given area is grazed**. How often a pasture is exposed to grazing or rested from grazing provides for different responses within the plant community due to differing opportunities for plant recovery.

Grazing Period is defined as the length of time grazing livestock or wildlife occupy a specific land area. \* The **length of time** a pasture is exposed to grazing **affects many variables** such as potential for regrowth of plant material, soil impacts and animal behavior. The **grazing period** influences the **intensity** of grazing and the **frequency** of grazing. It can also influence items tied to **animal behavior** such as trailing, and trampling such as between loafing and watering areas.

Habitat Capability. The estimated ability of an area, **given existing or predicted habitat conditions**, to support a wildlife, fish, or plant population. It is measured in terms of potential population numbers.

Indicator. **A measure or measurement** of an aspect of a sustainability criterion. **A quantitative or qualitative variable that can be measured or described** and, when observed periodically, **shows trends**. **Indicators are quantifiable performance measures** of outcomes or objectives for attaining criteria designed to assess progress toward desired conditions.

Information. Information is the result of **processing, manipulating, and organizing data in a way that adds to the knowledge of the receiver**. In other words, it is the context in which data is taken.

Information Management. The process by which an organization efficiently plans, collects, organizes, uses, controls, **disseminates and disposes of its inventory, monitoring, and assessment information**, and through which it ensures that the value of that information is identified and exploited to the fullest extent.

Information Needs Assessment. A process through which the types of information needed to accomplish an **inventory, monitoring, or assessment activity, and the types of data needed to support that information are identified**. Information needs assessments are used as a tool to identify the data and information necessary to support resource management decisions, and the best methods of collecting and maintaining resource data and displaying needed information.

Inventory. To **survey an area or entity** for determination of **such data as contents, condition, or value**, for specific purposes such as planning, evaluation, or management. An inventory activity may include an information needs assessment; planning and scheduling; data collection, classification, mapping, data entry, storage and maintenance; product development; evaluation; and reporting phases.

Inventory and Assessment. **Resource information is collected and assessed** based upon selected criteria and indicators useful to decision-making. Information is derived from **multiple sources** and **scales** to inform interrelated decision-making processes.

Key Area A relatively small portion of a range selected because of its location, use or grazing value as a **monitoring point for grazing use**. It is assumed that key areas, if properly selected, 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) The species which must, because of their importance, be considered in the management program.\*

Monitoring. A **systematic process of collecting information to evaluate changes** in actions, conditions, and relationships over time and space or **progress toward meeting desired conditions** or plan objectives.

Monitoring. The agency tracks performance measures to gauge progress toward desired conditions, by **monitoring at a scale that appropriately answers the monitoring questions. This monitoring provides data for informed decision-making, particularly so that adaptive management is responsive to emerging needs and changing conditions.**

The collection and analysis of repeated observations or measurements to evaluate changes in condition and progress toward meeting a resource or management objective. **A monitoring activity may include** an information needs assessment; planning and scheduling; data collection, classification, mapping, data entry, storage and maintenance; product development; evaluation; and reporting phases.

Monitoring The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. This process must be conducted over time in order to determine whether or not management objectives are being met. \*

Implementation Monitoring- This short-term monitoring answers the question, was the management implemented as designed. Annually documents several items. Examples include:

- 1) Were management actions implemented as designed, and
- 2) Did the management actions achieve the annual effect expected?

Items which may be documented through implementation monitoring include, but are not limited to: actual use (livestock numbers and days), condition of range improvements, utilization, wildlife observations.

Effectiveness Monitoring- This long-term monitoring documents whether management actions are having the expected progress towards achieving resource management objectives.

Need for Change. A **finding** by the responsible official that there is a need to modify plan components through a review of new issues and information, **monitoring and evaluation results**, and changes in law or regulation.

Objectives. Concise projections of **measurable, time-specific intended outcomes**. The objectives for a plan are the means of measuring progress toward achieving or maintaining desired conditions. Like desired conditions, objectives are aspirations and are not commitments or final decisions approving projects and activities (36 CFR 219.7). In the Strategic Plan, objectives are a more *focused statement of aim or purpose* for a strategic goal.

Planning. Emerging resource management needs are addressed by identifying desired conditions and objectives. **The future conditions are based on evaluation of monitoring, inventory, and assessment information.** National and local issues are considered and coordinated when developing strategic, program, and annual goals and objectives. Projects are planned to contribute to accomplishing the Forest Service's mission within the context of the Strategic Plan, land management plans, and annual appropriations.

Productivity. The **capacity of National Forest System lands and their ecological systems** to provide the various renewable resources **in certain amounts** in perpetuity. For the purposes of this subpart it is an ecological, not an economic, term (36 CFR 219.16).

Protocol. **Repeatable instructions for inventory, monitoring, and assessment activities** for such tasks as assessing information needs, and collecting, mapping, classifying, analyzing and evaluating, and applying information.

Quality Assurance. **The total integrated program for ensuring that the uncertainties inherent in inventory and monitoring data are known and do not exceed acceptable magnitudes, within a stated level of confidence.** Quality assurance encompasses the plans, specifications, and policies affecting the collection, processing, and reporting of data. It is the system of activities designed to provide officials with independent assurance that quality control is being effectively implemented uniformly throughout the inventory and monitoring programs.

Quality Control. The **routine application of prescribed field and office procedures** to reduce random and systematic errors and **ensure that data are generated within known and acceptable performance limits.** Quality control involves use of qualified personnel, reliable equipment and supplies, training of personnel, and strict adherence to service-wide standard operating procedures for tasks such as information needs assessments, establishment of standards and methods, data collection, data processing, classification, mapping, analysis, and dissemination.

Rangeland. Land on which **the indigenous vegetation (climax or natural potential)** is predominately grasses, grass-like plants, forbs, or shrubs and is managed as a natural ecosystem. If plants are introduced, they are managed similarly. Rangeland includes natural grasslands, savannas, shrub lands, many deserts, tundras, alpine communities, marshes, and meadows.

Resource Management Objectives are concise statements of **measurable, time –specific outcomes** intended to achieve desired conditions. The objectives for a plan are the means of measuring progress toward achieving or maintaining desired conditions. Adapted from: *Foundations of Forest Planning: Volume 1 (Version 2.0) Model of a Forest Plan*. USDA Forest Service, January 2005  
A good objective is "**SMART**": **Specific** in what it will accomplish; **Measurable** in what it will produce; **Achievable** (has a good chance of being carried out); **Realistic** within the given time frame and budget; and **Timefixed** (has an endpoint). Leslie, M. G.K. Meffe, J.L. Hardesty, and D.L. Adams. 1996. *Conserving Biodiversity on Military Lands: A Handbook for Natural Resources Managers*. The Nature Conservancy, Arlington, VA.

Rest is to leave an area of grazing land ungrazed or unharvested for a specific time, such as a year, a growing season or a specified period required within a particular management practice. \*

Seasonal Utilization is the **amount of utilization** that has occurred **before the end of the growing season**. Interagency Technical Reference 1734-3, page 1.

Standards. **Criteria** for desirable or tolerable conditions, or a statement or demonstration representing conditions of a job done properly. Standards define how well something should be done, rather than what should be done.

Standards-based approach and information management framework. An administrative structure for **managing inventory, monitoring, and assessment information based upon explicit standards of performance and operation, explicitly standardized tools, and clear standards of success**. Such a framework could include a transparent Quality Assurance System, a basic Information Needs Assessment process, an explicit National Protocol Governance System, or an Agency-wide Monitoring and Evaluation Framework that specifies agency priorities. It also could include Technology Transfer and Knowledge Transfer processes that facilitate leveraging work for multiple purposes.

Sustainability. Meeting needs of the present generation without compromising the ability of future generations to meet their needs. Sustainability is composed of desirable social, economic, and **ecological conditions or trends** interacting **at varying spatial and temporal scales** embodying the principles of multiple-use and sustained-yield.

Terrestrial Ecosystem Survey Terrestrial Ecosystem Unit Inventory: (TES/TEUI): is the systematic examination, description, classification, mapping and interpretation of terrestrial ecosystems. A terrestrial ecosystem is **an integrated representation of soil, climate and vegetation** as modified by geology, geomorphology, landform and disturbance processes. Refer to Terrestrial Ecological Unit Inventory Technical Guide: Landscape and Land Unit Scales, USDA Forest Service, Gen Tech Report WO-68, 2005.

Timing is the time of season grazing occurs relative to the phenological stage of plant development, such as early growth period, reproductive period, or dormant period. Disturbance, such as that from grazing, may provide differing responses within the plant depending upon the stage of development.

Trend. The direction of change in an attribute as observed over time.\*

Utilization is the **proportion or degree** of the current year's forage production that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or to the vegetation community as a whole. Interagency Technical Reference 1734-3, page 133.

Watershed Condition. The state of the watershed based on physical and biogeochemical characteristics and processes such as hydrologic, geomorphic, landscape, topographic, vegetative cover, and aquatic habitat; water flow characteristics and processes such as volume and timing; and water quality characteristics and processes such as chemical, physical, and biological as they affect water quality and water resources (65 FR 62572, October 18, 2000).

## **Monitoring**

**It is essential that the Forest Service track resource conditions and human activities over time to effectively manage the Nation's forests and grasslands.** The measures or indicators used for monitoring will vary depending on the level of planning to which they apply. (Chief Abigail Kimball, USDA Forest Service Strategic Plan FY 2007–2012, p.8)