Appendix A--Fundamentals of Rangeland Health

(excerpted from "Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington" (1997))

The objectives of the rangeland health regulations are: "to promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; . . . and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands."

To help meet these objectives, the regulations on rangeland health identify fundamental principles providing direction to the States, Districts, and on-the-ground public land managers and users in the management and use of rangeland ecosystems.

A hierarchy, or order, of ecological function and process exists within each ecosystem. The rangeland ecosystem consists of four primary, interactive components: a physical component, a biological component, a social component, and an economic component. This perspective implies that the physical function of an ecosystem supports the biological health, diversity and productivity of that system. In turn, the interaction of the physical and biological components of the ecosystem provides the basic needs of society and supports economic use and potential.

The Fundamentals of Rangeland Health stated in 43 CFR 4180 are:

> 1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity and the timing and duration of flow.
>
> 2. Ecological processes, including the hydrologic cycle, nutrient cycle and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
>
> 3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.
>
> 4. Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities. They provide direction in the development and implementation of the standards for rangeland health.

Appendix B--OR/WA BLM Standards and Indicators for Rangeland Health

Standard 1 Watershed Function – Uplands

Upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate and landform.

Rationale and Intent

This standard focuses on the basic physical functions of upland soils that support plant growth, the maintenance or development of plant populations and communities, and promote dependable flows of quality water from the watershed.

To achieve and sustain rangeland health, watersheds must function properly. Watersheds consist of three principle components: the uplands, riparian/wetland areas and the aquatic zone. This standard addresses the upland component of the watershed. When functioning properly, within its potential, a watershed captures, stores and safely releases the moisture associated with normal precipitation events (equal to or less than the 25 year, 5 hour event) that falls within its boundaries. Uplands make up the largest part of the watershed and are where most of the moisture received during precipitation events is captured and stored.

While all watersheds consist of similar components and processes, each is unique in its individual makeup. Each watershed displays its own pattern of landform and soil, its unique climate and weather patterns, and its own history of use and current condition. In directing management toward achieving this standard, it is essential to treat each unit of the landscape (soil, ecological site, and watershed) according to its own capability and how it fits with both smaller and larger units of the landscape.

A set of potential indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The appropriate indicators to be used in determining attainment of the standard should be drawn from the following list.

Potential Indicators

Protection of the soil surface from raindrop impact; detention of overland flow; maintenance of infiltration and permeability, and protection of the soil surface from erosion, consistent with the potential/capability of the site, as evidenced by the:

- amount and distribution of plant cover (including forest canopy cover);
- amount and distribution of plant litter;
- accumulation/incorporation of organic matter;
- amount and distribution of bare ground;
- amount and distribution of rock, stone, and gravel;

- plant composition and community structure;
- thickness and continuity of A horizon;
- character of microrelief;
- presence and integrity of biotic crusts;
- root occupancy of the soil profile;
- biological activity (plant, animal, and insect); and
- absence of accelerated erosion and overland flow.

Soil and plant conditions promote moisture storage as evidenced by:

- amount and distribution of plant cover (including forest canopy cover);
- amount and distribution of plant litter;
- plant composition and community structure; and
- accumulation/incorporation of organic matter.

Standard 2 Watershed Function - Riparian/Wetland Areas

Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.

Rationale and Intent

Riparian-wetland areas are grouped into two major categories: 1. lentic, or standing water systems such as lakes, ponds, seeps, bogs, and meadows; and 2. lotic, or moving water systems such as rivers, streams, and springs. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Riparian areas commonly occupy the transition zone between the uplands and surface water bodies (the aquatic zone) or permanently saturated wetlands.

Properly functioning condition of riparian and wetland areas describes the degree of physical function of these components of the watershed. Their functionality is important to water quality in the capture and retention of sediment and debris, the detention and detoxification of pollutants, and in moderating seasonal extremes of water temperature. Properly functioning riparian areas and wetlands enhance the timing and duration of streamflow through dissipation of flood energy, improved bank storage, and ground water recharge. Properly functioning condition should not be confused with the Desired Plant Community (DPC) or the Desired Future Condition (DFC) since, in most cases, it is the precursor to these levels of resource condition and is required for their attainment.

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met. The criteria are based upon the potential (or upon the capability where potential cannot be achieved) of individual sites or land

forms.

Potential Indicators

Hydrologic, vegetative, and erosional/depositional processes interact in supporting physical function, consistent with the potential or capability of the site, as evidenced by:

- frequency of floodplain/wetland inundation;
- plant composition, age class distribution, and community structure;
- root mass;
- point bars revegetating;
- streambank/shoreline stability;
- riparian area width;
- sediment deposition;
- active/stable beaver dams;
- coarse/large woody debris;
- upland watershed conditions;
- frequency/duration of soil saturation; and
- water table fluctuation.

Stream channel characteristics are appropriate for landscape position as evidenced by:

- channel width/depth ratio;
- channel sinuosity;
- gradient;
- rocks and coarse and/or large woody debris;
- overhanging banks;
- pool/riffle ratio;
- pool size and frequency; and
- stream embeddedness.

Standard 3 Watershed Function - Ecological Processes

Healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate and landform are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

Rationale and Intent

This standard addresses the ecological processes of energy flow and nutrient cycling as influenced by existing and desired plant and animal communities without establishing the kinds, amounts or proportions of plant and animal community compositions. While emphasis may be on native species, an ecological site may be

capable of supporting a number of different native and introduced plant and animal populations and communities while meeting this standard. This standard also addresses the hydrologic cycle which is essential for plant growth and appropriate levels of energy flow and nutrient cycling. Standards 1 and 2 address the watershed aspects of the hydrologic cycle.

With few exceptions, all life on earth is supported by the energy supplied by the sun and captured by plants in the process of photosynthesis. This energy enters the food chain when plants are consumed by insects and herbivores and passes upward through the food chain to the carnivores. Eventually, the energy reaches the decomposers and is released as the thermal output of decomposition or through oxidation.

The ability of plants to capture sunlight energy, to grow and develop, to play a role in soil development and watershed function, to provide habitat for wildlife and to support economic uses depends on the availability of nutrients and moisture. Nutrients necessary for plant growth are made available to plants through the decomposition and metabolization of organic matter by insects, bacteria and fungi, the weathering of rocks and extraction from the atmosphere. Nutrients are transported through the soil by plant uptake, leaching and by rodent, insect and microbial activity. They follow cyclical patterns as they are used and reused by living organisms.

The ability of rangelands to supply resources and satisfy social and economic needs depends on the buildup and cycling of nutrients over time. Interrupting or slowing nutrient cycling can lead to site degradation, as these lands become increasingly deficient in the nutrients plants require.

Some plant communities, because of past use, frequent fire or other histories of extreme or continued disturbance, are incapable of meeting this standard. For example, shallow-rooted winter-annual grasses that completely dominate some sites do not fully occupy the potential rooting depth of some soils, thereby reducing nutrient cycling well below optimum levels. In addition, these plants have a relatively short growth period and thus capture less sunlight than more diverse plant communities. Plant communities like those cited in this example are considered to have crossed the threshold of recovery and often require great expense to be recovered. The cost of recovery must be weighed against the site's potential ecological/economic value in establishing treatment priorities.

The role of fire in natural ecosystems should be considered, whether it acts as a primary driver or only as one of many factors. It may play a significant role in both nutrient cycling and energy flows.

A set of indicators has been identified for which site-specific criteria will be used to determine if this standard is being met.

Potential Indicators

Photosynthesis is effectively occurring throughout the potential growing season, consistent with the potential/capability of the site, as evidenced by plant composition and community structure.

Nutrient cycling is occurring effectively, consistent with the potential/capability of the site, as evidenced by:

- plant composition and community structure;
- accumulation, distribution, incorporation of plant litter and organic matter into the soil;
- animal community structure and composition;
- root occupancy in the soil profile; and
- biological activity including plant growth, herbivory, and rodent, insect and
- microbial activity.

Standard 4 Water Quality

Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

Rationale and Intent

The quality of the water yielded by a watershed is determined by the physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, the uses to which the land is put and the quality of the management of those uses. Standards 1, 2 and 3 contribute to attaining this standard.

States are legally required to establish water quality standards and Federal land management agencies are to comply with those standards. In mixed ownership watersheds, agencies, like any other land owners, have limited influence on the quality of the water yielded by the watershed. The actions taken by the agency will contribute to meeting State water quality standards during the period that water crosses agency administered holdings.

Potential Indicators

- Water quality meets applicable water quality standards as evidenced by:
- water temperature;
- dissolved oxygen;
- fecal coliform;
- turbidity;
- pH;

- populations of aquatic organisms; and
- effects on beneficial uses (i.e., effects of management activities on beneficial uses as defined under the Clean Water Act and State implementing regulations).

Standard 5 Native, T&E, and Locally Important Species

Habitats support healthy, productive and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate and landform.

Rationale and Intent

Federal agencies are mandated to protect threatened and endangered species and will take appropriate action to avoid the listing of any species. This standard focuses on retaining and restoring native plant and animal (including fish) species, populations and communities (including threatened, endangered and other special status species and species of local importance). In meeting the standard, native plant communities and animal habitats would be spatially distributed across the landscape with a density and frequency of species suitable to ensure reproductive capability and sustainability. Plant populations and communities would exhibit a range of age classes necessary to sustain recruitment and mortality fluctuations.

Potential Indicators

Essential habitat elements for species, populations and communities are present and available, consistent with the potential/capability of the landscape, as evidenced by:

- plant community composition, age class distribution, productivity;
- animal community composition, productivity;
- habitat elements;
- spatial distribution of habitat;
- habitat connectivity;
- population stability/resilience.

Appendix C--Ecosystem Management
(SEORMP-FEIS, Chapter 3, pages 141-151)

Ecosystem management can be viewed as hierarchical and occurring at multiple levels. The basic planning levels are (1) the broad scale or regional perspective depicted by the Interior Columbia Basin Ecosystem Management Project (ICBEMP); (2) the mid scale which can be the size of a resource area or several resource areas and is the scale analyzed in the Southeast Oregon Resource Management Plan/ Environmental Impact Statement (SEORMP/EIS), and (3) the fine scale which can be the size of pastures, allotments, watersheds, subwatersheds, subbasins, or other geographic subunits and is at the level of activity plans such as allotment management plans (AMP's), habitat management plans (HMP's), Water Quality Management Plans (WQMP's), or other integrated activity plans for geographic units. At each level of planning, implementation is periodically adjusted as management is adapted to changing conditions, circumstances, and new information.

Monitoring and evaluations need to follow the same pattern, answering questions and measuring trends at the various levels. Certain issues and activities within the area can have effects at the broadest level, such as activities that affect air quality, noxious weeds, or wide-ranging species. Other issues or activities, such as forest health, western juniper encroachment, and species endemism, operate within smaller geographic areas. Still other issues or activities are mostly of local concern, such as access management and municipal watersheds. Monitoring strategies need to recognize this hierarchy and provide for data collection and evaluation at the appropriate levels.

Broad Scale

The ICBEMP scientific assessment is a regional level or broad-scale assessment. It covers public land in the RMP planning area of southeast Oregon as well as other lands in eastern Oregon, eastern Washington, Idaho, and parts of Montana. The scientific assessment was used as a context for land use and resource management analysis at lower levels of planning.

ICBEMP has developed an ecosystem analysis process to characterize human and ecological features, conditions, process, and interactions within a geographic area. A program would be developed that would allow information gathered locally to be compiled and analyzed to answer broad regional questions and use regional level assessments to better address broad-scale questions. The analysis would be intended to help estimate direct, indirect, and cumulative effects of management activities and guide the general type, location, and sequence of appropriate management activities within a regional area.

Mid Scale

The step-down from the ICBEMP scientific assessment is the SEORMP. The SEORMP is the mid-scale plan which links broad-scale scientific assessments with plan implementation at the activity level (fine-scale). It covers JRA and Malheur Resource Area (MRA) of the Vale BLM District. The proposed SEORMP/FEIS is consistent with those scientific and management philosophies developed in the ICBEMP.

The record of decision (ROD) for each resource area would include management objectives and priorities for management. Implementation of the RMP would be monitored on a continual basis to allow up-to-date response to changing conditions. Management actions arising from activity plan decisions would be evaluated to ensure consistency with SEORMP/FEIS objectives.

The SEORMP/EIS starts the step-down process by initiating (1) the collaboration and scoping process, (2) validation of the ICBEMP scientific assessment, (3) prioritization of fine-scale areas for review or assessment and evaluation, and (4) data gap identification. This process is designed to ensure that broad-scale analysis is viewed and validated within the context of local conditions, and it ensures that local decisions are made within the context of broad-scale goals and objectives. This is accomplished by using the best available information from multiple-scale assessments to provide a comprehensive basis for sustainable ecosystem management.

Fine Scale

The step-down from PSEORMP/FEIS to the fine scale is the GMA assessment, evaluation, and planning. The GMA's (Table 3-2; Map GMA-1) that would be assessed and evaluated vary in size depending upon watersheds, issues, concerns, dependent resources, resource potentials and capabilities that are reviewed by interdisciplinary teams in each resource area in consultation with the interested public and affected land users. GMA's and their priority for assessment and evaluation were derived primarily from a combination of subbasin and allotment boundaries based on a variety of issues including the following:

- legal mandates ("Clean Water Act"[CWA], ESA, and others);
- priorities established in existing land use plans;
- resources at risk;
- potential for recovery;
- resource conflicts or controversy;
- opportunity for interagency or partnership assessments;
- field staff knowledge of the area; and
- current ongoing management.

This preliminary prioritization and scoping process was presented to and approved by the Southeast Oregon Resource Advisory Council (SEORAC) before inclusion in the SEORMP. It was also sent to the interested public, local, state and Federal agencies, and tribes for comment. Periodic validation of issues is an important part of fine-scale assessments and evaluations. The schedule for completion of GMA evaluations would be reviewed annually to determine if there have been any changes in resource issues, BLM policies, regulations, law or other concerns that would warrant a change in the priorities for each resource area. It is anticipated that management actions implemented in each GMA would be evaluated at least once every ten years by an interdisciplinary team. Based on recommendations of those evaluations, current activity plans within each GMA would be revised or rewritten as necessary to ensure consistency with RMP objectives. Work would focus on higher priority areas; however, other areas may require interim attention to address site-specific needs.

Consultation and collaboration with interested public, affected land users, other agencies, counties, Tribes, and others is an important part of the process to help identify issues and to bring together all the existing information concerning a given area. Information assembled during the assessment would be evaluated to determine appropriate management actions at the fine scale. These evaluations would be done using an ecosystem analysis process that looks at human and ecological features, conditions, processes, and interactions. The evaluation process would also involve consultation and collaboration with affected parties. It is during this time that priorities for actions regarding restoration, conservation, or other management actions would be discussed.

The end result of the GMA evaluation process would be the development of recommendations for future actions affecting the management of resources and uses in the GMA. Recommendations on management changes may be implemented through activity plans, management agreements, or direct decisions and would depend on the complexity of issues.

Appendix D--Adaptive Management
(SEORMP-FEIS, Chapter 3, pages 149-151)

The proposed SEORMP/FEIS is based on adaptive management, which is a continuing process of planning, implementation, monitoring, and evaluation, to adjust management strategies to meet goals and objectives of ecosystem management. The concept of adaptive management uses the latest scientific information, site-specific information/data, and professional judgment to select the management strategy most likely to meet goals and objectives. The concept also acknowledges the need to manage resources under varying degrees of uncertainty as well as the need to adjust to new information. Through continually adjusting management strategies as needed, supported by monitoring or additional information, adaptive management would result in attainment of short- and long-term trend toward meeting objectives. Adaptive management provides the capability to respond quickly to monitoring data with consideration given to past season monitoring or preseason conditions. It also allows changes needed to meet long-term objectives of the RMP including direction from the "Wild and Scenic Rivers Act" (WSRA), ESA, CWA, and "Standards of Rangeland Health and Guidelines for Livestock Grazing Management" (S&G's).

Although there is widespread support for the adaptive management principle and process, many critics lack confidence in the Bureau's ability to implement management based on this process. Thus, it is imperative that the each part of the cyclical process be implemented on schedule or as new data become available to ensure that appropriate management of public land resources is implemented. To ensure timely step-wise progression through the adaptive management process, GMA's would be used to prioritize available funding. The detail, methodology, and intensity of studies chosen for a particular area would be determined by the nature and severity of the resource conflicts present in that area. As a result, a flexible monitoring plan is required to periodically change priorities and monitoring intensity, based on significant changes that indicate a need for more information.

The following briefly describes the four parts of adaptive management:

1) *Planning/Decision*—Plan development or revision is the process which includes decision-making. It starts with issue identification and goal development. The next step is to gather information necessary to develop alternatives for management direction that address the issues and goals. The final stage of planning is to develop alternative management strategies to address issues and meet the management goals and objectives, analyze the consequences of the alternatives, and choose a management strategy and actions for implementation.

2) *Implementation*—Plan implementation is the process of putting decisions into effect. Objectives are defined as indicators used to measure progress toward attainment of goals. They address short- and long-term actions taken to meet goals and the DRFC. Unless otherwise stated, all objectives listed in the RMP are assumed to be implemented within the life of the plan.

3) *Monitoring*— Monitoring is the orderly collection, analysis, and interpretation of resource

data utilized to evaluate progress in meeting management objectives. Inventories and surveys are integral parts of monitoring and would be initiated as need is defined. Information gathered in the inventory and survey process form a baseline from which trends can be measured.

Monitoring efforts provide information to: (1) determine if planned activities have been implemented; (2) detect magnitude and duration of change in conditions and trends; (3) increase understanding of cause and effect relationships; (4) predict impacts; and (5) assess whether S&G's are being met. If monitoring studies indicate that objectives are not being met, or that progress is not being made toward meeting the S&G's, management actions would be adjusted accordingly (see Appendix Q). The specific type and location of studies instituted would be more specifically identified within individual activity plans.

Methods of monitoring are briefly identified for each program in the narrative of Chapter 3 and expanded in Appendix W, Monitoring. Monitoring methods in some programs are not expanded in the monitoring appendix since they are not key components of rangeland health assessments. At times, data pertinent to these programs are essential on a site-specific basis (e.g., cultural, mining, social/economic values) and can be a part of the evaluation based on the situation. Methodology and intensity of studies that are chosen for a particular area or scale would be determined by the nature and severity of the resource conflicts that are present.

For monitoring data to be meaningful and useful over time, there must be consistency in the kinds and manner in which data are collected. However, a need for changes in sampling may occasionally arise when problems are detected. This could be during a review of the data collected, when analyzing and interpreting the data, or when conducting an assessment or evaluation.

4) *Evaluation/Assessment*— Analysis and interpretation of inventory and monitoring data are central to identifying progress in meeting resource management objectives outlined in the RMP and activity plans. There are three aspects of evaluation/assessment. The first is evaluation of whether planned actions have been implemented. The second is evaluation of the resource-specific information/data to determine whether identified management objectives are being accomplished. The third aspect is the evaluation of plans to determine whether identified management objectives and management actions remain appropriate to public desires or if plans need to be revised or amended.

The analysis and interpretation of inventory and monitoring data are critical in the evaluation of management actions in order to determine progress in meeting resource management objectives outlined in the plan. Since management adjustments may be needed periodically, a continual feedback loop based on new information would allow for mid-course corrections at time intervals appropriate to the systems, processes, and functions analyzed.

The final stage of evaluation is the development of recommendations for changing current management actions, as needed, to meet objectives and ecosystem management goals. Adjustments should be related to implementation of activity plan objectives, standards and guidelines, and monitoring needs. Recommendations should be used to modify land use plans, if

needed, thus continuing the adaptive management cycle.

Appendix E -- Calculation of Big Game Forage Demand

Big game numbers used to set forage demand were supplied by the State of Oregon, Department of Fish and Wildlife, and are based on State-approved management objectives (MO's) and benchmark levels by seasons of use and grazing allotment.

Forage demand for bighorn sheep was not calculated because specific locations of bighorn use in LCGMA at the pasture level were not obtainable.

Mathematical Calculations Used for Determining Wildlife Forage Demand
Big game forage demand in the SEORMP/FEIS, Appendix E, Allotment Summaries, was established by using the three mathematical calculations described below. These calculations are consistent with the "Three Rivers Resource Management Plan" (1991) in Burns District, and they use locally adapted studies on big game dietary overlap cited in Vavra and Sneva (1978).

1) Land ownership differences - The percentage of the grazing allotment administered by BLM was multiplied by the MO/benchmark level number to determine the number of big game supported on public land versus other ownerships such as state or private.

2) Body mass differences - The number of big game at MO/benchmark levels supported on BLM lands was then divided by a factor of 5.3 (for deer), 7.0 (for pronghorn), and 2.4 (for elk) to determine the number of each species that would potentially consume forage equal to one AUM, which is defined as 800 pounds of air dry forage. The result of this calculation is referred to as the *unadjusted forage demand* because it does not factor the dietary differences between livestock and big game.

3) Dietary preference differences - The unadjusted forage demand was then multiplied by the percent dietary overlap for each big game species (0.18 for deer, 0.10 for antelope, and 0.70 for elk) to correct for the differences in forage preferences between livestock and big game. The result is called *adjusted forage demand* or *competitive AUM's* . For example, the adjusted big game forage demand (competitive AUM's) needed to support 50 mule deer on an allotment with 80 percent public land over a period of 12 months would be 86.4 AUM's (50 deer H 12 months H 18 percent dietary overlap H 80 percent public land).

Appendix F--Public Scoping Information

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Vale District Office
100 Oregon Street
Vale, Oregon 97918

IN REPLY REFER TO: 1610/4120/8354

PUBLIC SCOPING MEETING
Louse Canyon Geographic Management Area Assessment, Analysis and Evaluation
Bureau of Land Management, Vale District Office Conference Room
June 26, 2000 at 7:00 - 9:00 pm (MT)
Jordan Valley, Oregon, Lions Hall
June 27, 2000 at 1:00 - 3:00 pm (MT)
McDermitt, Nevada, Community Hall
June 27, 2000 at 7:00 - 9:00 pm (PT)

Dear Public Land User:

The Jordan Resource Area, of the Vale District, Bureau of Land Management, has scheduled two public scoping meetings to help in the assessment, analysis, and evaluation of the Louse Canyon Geographic Management Area (GMA). The purpose of the meetings is to brief you on the GMA process and to solicit your issues and concerns in the Louse Canyon GMA (see map on back). In addition, we request any resource information you may have that would assist in this effort. This effort may have an affect on the future management of resources and uses in the Louse Canyon GMA. Participation is extremely important to insure you are represented in the process.

Both meetings will have the same agenda, as follows:

- Briefing on the GMA process, including a preliminary discussion of issues, goals and objectives that have been identified.

- Identification of additional issues and concerns regarding the Louse Canyon GMA

- Request for resource information or data that would assist the effort. Examples of valuable information are: water quality data, weed infestations, wildlife sightings, sage grouse leks, new roads and trails, recreation use, archaeological sites, upland or riparian conditions depicted as data or in old photographs, etc.

We hope that you are able to attend one of the three meetings. However, if you are not able to attend and you wish to express your issues, concerns or to share information, please do so by writing to the Vale District Office, attn: Jordan Field Office Manager. If you have any questions please contact me or Tom Miles (team leader) at (541) 473-3144.

Sincerely,
Jerry L. Taylor
Jordan Field Manager

Miles, Tom:mjm:6/12/00:publicscopingmtg

Meeting Notes

Vale

- Flexibility for livestock grazing (turnout to early)
- Livestock grazing needs better management
- Upper West little is grazed at the same hot season every year, need flexibility to determine

Bob Kindschy

- Wants us to use method of companies Color IR photos from past to present (see Bob's handout)
- Wants us to rerun successional theory method to run 8 different sites that he and Crouse did.
- We need to analyze all the existing data
- Method (successional theory)
    1. set up a quadrangle in stream
    2. analyze the good vs. bad in quadrangle
    3. good is willows, herbaceous cover
    4. bad is sage coming in, bare ground
    5. may need to consider contracting
- Concerns over meth labs
- Dump sites or dirty camps
- Riparian potential not being considered in some efforts need to understand the scouring and flushing of Louse Canyon and the potential is not that great.
- Need to re-analyze all our existing information.
- Native American livestock trespass problem

McDermitt

- Predator control - effects on wildlife
- ATV use by hunters in the fall
- By focusing attention on this area, advertising to invite more people to come and cause more problems on private and public lands.

Appendix G – Upland Wildlife Habitat Field Measurements used for the LCGMA Evaluation

To characterize wildlife habitat and as a supplement to the range assessment information recorded on standard BLM Range Health field forms, BLM also measured or estimated the following attributes at most of the stops where assessments were conducted. The locations where these measurements were taken are part of the assessment record.

Sagebrush and bluebunch wheatgrass heights –
Bluebunch wheatgrass heights were measured at ungrazed sites to the top of the tallest erect leaves or , in the case of robust grass plants, to the point of leaf droop (not to the top of the seed heads). This was done to determine if key grass species in LCGMA had the potential to provide lateral cover (7" or more) necessary to hide nesting sage grouse. These grass height measuring protocols have been used in Oregon sage grouse habitat research. No forb heights were measured.

Sagebrush heights were measured to the top of the tallest leaves (not the top of the seed heads).

Distribution of sagebrush canopy classes-
BLM estimated the distribution of sagebrush canopy classes per pasture in a way comparable to Appendix F, SEORMP/FEIS (see Table 9, this document). Canopy class character and distribution were determined using a combination of methods including ocular reconnaissance from vehicles and aircraft, 500 point step-points, and 100 foot line intercepts. Calibration for ocular estimates was based on line intercept and step-point sample results. Canopy values were often made up of combinations of classes.

Note: *None of the height and canopy cover data were collected in a manner that would withstand rigorous statistical analysis. They were collected for the purpose of sampling typical habitat character at Rangeland Health assessment locations in a manner consistent with the intent and allowable time-frames of BLM range health assessments.*

Digital photos –
Photos are a good supplemental assessment tool for landscape analysis that are of value when combined with standard BLM range trend studies. Range trend studies monitor small plots as proxy for vegetation change in a pasture and as such they may not provide a good sense of the overall landscape appearance, connectivity, or fragmentation in upland habitat types.

About 180 digital images of upland habitat were taken. Two or more pictures were taken in the vicinity of range health assessment sites to associate the appearance of the landscape (understandable by a wide audience) with technical field data. A subset of these photos was used as a representative **Landscape Appearance Photo Series** (Appendix J)**.** In most cases two landscape views and one understory closeup were taken. Because the photos are tied to sites located with GPS instrumentation, they may be easily located and revisited. The photos are sorted by grazing allotment and pasture.

Habitat measures and ties to existing literature

The objective of gathering the supplemental data was to directly link vegetative composition and structure in LCGMA with wildlife habitat requirements and preferences as described in:

- Interior Columbia Basin Ecosystem Management Project, Source Habitats for Terrestrial Vertebrates of Focus
- OR/WA BLM. 2000. Greater Sage-grouse and Sagebrush Steppe Ecosystems Management Guidelines
- Altman, R. and A. Holmes. 2000. Conservation Strategy for Landbirds in the Columbia Plateau of Eastern Oregon and Washington
- Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats, Wildlife Society Bulletin 28(4):967-985

Appendix H - Common and Scientific Names for Plants and Animals in the Southeast Oregon Resource Management Plan Area

PLANT SPECIES

Forbs

Alvord milkvetch *Astragalus alvordensis*
Arrowleaf balsamroot *Balsamorhiza sagittata*
Barren Valley collomia *Collomia renacta*
Biddle's lupine *Lupinus biddlei*
Biennial stanleya *Stanleya confertiflora*
Bigelow's four o'clock *Mirabilis bigelovii* var.*retrorsa*
Biscuitroot *Lomatium* spp.
Brandegee's onion *Allium brandegei*
Broad-flowered chaenactis *Chaenactis stevioides*
California chicory *Rafinesquia californica*
Camas *Camassia* spp.
Chambers twinpod *Physaria chambersii*
Clasping pepperweed *Lepidium perfoliatum*
Cooper's goldenflower *Hymenoxys lemmonii*
Cronquist's stickseed *Hackelia cronquistii*
Cusick's chaenactis *Chaenactis cusickii*
Cusick's giant hyssop *Agastache cusickii*
Davis' peppergrass *Lepidium davisii*
Desert chaenactis *Chaenactis xantiana*
Ertter's senecio *Senecio ertterae*
Four-winged milkvetch *Astragalus tetrapterus*
Golden buckwheat *Eriogonum chrysops*
Goosefoot *Chenopodium* spp.
Greeley's cymopterus *Cymopterus acaulis* var. *greeleyorum*
Grimy ivesia *Ivesia rhypara* var. *rhypara*
Hairy wild cabbage *Caulanthus pilosus*
Hairy-foot plantain *Plantago eriopoda*
Halogeton *Halogeton glomeratus*
Hedgehog cactus *Pediocactus simpsonii* var. *robustior*
Ibapah wavewing *Cymopterus ibapensis*
Janish's penstemon *Penstemon janishiae*
King's penstemon *Penstemon kingii*
King's rattleweed *Astragalus calycosus*
Kruckeberg's hollyfern *Polystichum kruckebergii*
Largehead clover *Trifolium macrocephalum*
Large-flowered chaenactis *Chaenactis macrantha*
Lemmon's onion *Allium lemmonii*
Low hawksweed *Crepis modocensis* ssp. *modocensis*

Mackenzie's phacelia *Phacelia lutea* var. *mackenzieorum*
Male fern *Dryopteris filix-mas*
Malheur cryptantha *Cryptantha propria*
Malheur stylocline *Stylocline psilocarphoides*
Malheur Valley fiddleneck *Amsinckia carinata*
Mulford's milkvetch *Astragalus mulfordiae*
Naked-stemmed phacelia *Phacelia gymnoclada*
Ochre-flowered buckwheat *Eriogonum ochrocephalum* ssp. *calcareum*
Onion *Allium* spp.
Owyhee clover *Trifolium owyheense*
Owyhee milkvetch *Astragalus atratus* var. *owyheensis*
Packard's mentzelia *Mentzelia packardiae*
Packard's lomatium *Lomatium packardiae*
Palmer's evening-primrose *Camissonia palmeri*
Phlox *Phlox* spp.
Playa buckwheat *Eriogonum salicornioides*
Playa phacelia *Phacelia inundata*
Prickly-poppy *Argemone munita* ssp. *rotundata*
Punctate langloisa *Langloisia setosissima* ssp. *punctata*
puncture-vine (*Tribulus terrestris*)
Raven's lomatium *Lomatium ravenii*
Rose's lomatium *Lomatium roseanum*
Rush skeletonweed *Chondrilla juncea*
Salt heliotrope *Heliotropium curassavicum*
Scotch thistle (*Onopordum acanthium*)
Short-lobed penstemon *Penstemon seorsus*
Siberian water-milfoil *Myriophyllum sibiricum*
Sinister gilia *Gilia sinistra* ssp. *sinistra*
Slender wild cabbage *Caulanthus major* var. *nevadensis*
Smooth mentzelia *Mentzelia mollis*
Smooth malacothrix *Malacothrix glabrata*
Snake River cryptantha *Cryptantha spiculifera*
Snake River goldenweed *Pyrrocoma radiata*
Snake River milkvetch *Astragalus purshii* var. *ophiogenes*
Spreading stickseed *Hackelia patens* var. *patens*
Sterile milkvetch *Astragalus sterilis*
Sweet-clover *Melilotus* spp.
Texas bergia *Bergia texana*
Three Forks stickseed *Hackelia ophiobia*
Trout Creek milkvetch *Astragalus salmonis*
Two-stemmed onion *Allium bisceptrum*
Tumble mustard *Sisymbrium altissimum*
Weak-stemmed milkvetch *Astragalus solitarius*
White locoweed *Oxytropis sericia* var. *sericea*
White-flowered penstemon *Penstemon pratensis*
Whitetop (*Cardaria* spp)

Yellow star thistle *Centaurea solstitialis*

Grasses and grasslike plants
Alkali bulrush *Scirpus robustus*
Annual dropseed *Muhlenbergia minutissima*
Baltic rush *Juncus balticus*
Basin wildrye *Leymus cinereus*
Bluebunch wheatgrass *Pseudoroegneria spicata*
Bottlebrush squirreltail *Elymus elymoides*
Cattail *Typha spp.*
Cheatgrass *Bromus tectorum*
Creeping wildrye *Leymus triticoides*
Crested wheatgrass *Agropyron cristatum*
Foxtail barley *Hordeum jubatum*
Idaho fescue *Festuca idahoensis*
Indian ricegrass *Oryzopsis hymenoides*
Mountain brome *Bromus carinatus*
Needlegrass *Stipa* spp.
Needleandthread grass *Stipa comata*
Nodding melic *Melica stricta*
Pinegrass *Calamagrostis rubescens*
Porcupine sedge *Carex hystericina*
Prairie Junegrass *Koeleria macrantha*
Profuse-flowered mesa mint *Pogogyne floribunda*
Rush *Juncus* spp.
Saltgrass *Distichlis spicata*
Sand dropseed *Sporobolus cryptandrus*
Sandberg bluegrass *Poa secunda*
Sixweeks fescue *Vulpia octoflora*
Sedge *Carex* spp.
Slender wheatgrass *Elymus trachycaulus*
Smooth brome *Bromus inermis*
Spikerush *Eleocharis* spp.
Thurber's needlegrass *Stipa thurberiana*
Torrey's rush *Juncus torreyi*
Western wheatgrass *Pascopyrum smithii*

Shrubs
Antelope bitterbrush *Purshia tridentata*
Basin big sagebrush *Artemisia tridentata* ssp. *tridentata*
Big sagebrush *Artemisia tridentata*
Bitter cherry *Prunus emarginata*
Black sagebrush *Artemisia nova*
Bud sagebrush *Artemesia spinescens*
Ceanothus *Ceanothus* spp.
Common snowberry *Symphoricarpos albus*

Coyote willow *Salix exigua*
Fourwing saltbush *Atriplex canescens*
Gray rabbitbrush *Chrysothamnus nauseosus*
Greasewood *Sarcobatus vermiculatus*
Green rabbitbrush *Chrysothamnus viscidiflorus*
Horsebrush *Tetradymia* spp.
Iodine bush *Allenrolfea occidentalis*
Lemmon willow *Salix lemmonii*
Lewis' mockorange *Philadelphus lewisii*
Long-flowered snowberry *Symphoricarpos longiflorus*
Low sagebrush *Artemisia arbuscula*
Mormon tea *Ephedra viridis*
Mountain big sagebrush *Artemisia tridentate* ssp. *vaseyana*
Mountain mahogany *Cercocarpus ledifolius*
Mountain snowberry *Symphoricarpos oreophilus*
Oregon grape *Mahonia repens*
Owyhee sagebrush *Artemisia papposa*
Pacific willow *Salix lucida* ssp. *lasiandra*
Packard's artemisia *Artemisia packardiae*
Peachleaf willow *Salix amygdaloides*
Rabbitbrush *Chrysothamnus* spp.
Redosier dogwood *Cornus sericea*
Sandbar willow *Salix exigua*
Saskatoon serviceberry *Amelanchier alnifolia*
Scouler's willow *Salix scouleriana*
Shadscale saltbush *Atriplex confertifolia*
Silver sagebrush *Artemisia cana*
Spiny hopsage *Grayia spinosa*
Spiraea *Spiraea* spp.
Squaw apple *Peraphyllum ramosissimum*
Stiff sagebrush *Artemisia rigida*
Threetip sagebrush *Artemisia tripartita*
Western chokecherry *Prunus virginiana*
Whiplash willow *Salix lasiandra*
Willow *Salix* spp.
Winterfat *Krascheninnikovia lanata*
Wood's rose *Rosa woodsii*
Wyoming big sagebrush *Artemisia tridentate* ssp. *wyomingensis*
Yellow willow *Salix lutea*

Trees
Alder *Alnus* spp.
Black cottonwood *Populus balsamifera* ssp. *trichocarpa*
Douglas fir *Pseudotsuga menziesii*
Engelmann spruce *Picea engelmannii*
Grand fir *Abies grandis*

Lodgepole pine *Pinus contorta*
Mountain alder *Alnus incana*
Narrowleaf cottonwood *Populus angustifolia*
Ponderosa pine *Pinus ponderosa*
Quaking aspen *Populus tremuloides*
Western juniper *Juniperus occidentalis*
Western larch *Larix occidentalis*
White fir *Abies concolor*

ANIMALS
Amphibians
Blotched tiger salamander *Ambystoma tigrinum melanostictum*
Columbia spotted frog *Rana luteiventris*
Northern leopard frog *Rana pipiens*
Pacific treefrog *Hyla regilla*
Western toad *Bufo boreas*

Birds
American avocet *Recurvirostra americana*
American kestrel *Falco sparverius*
American robin *Turdus migratorius*
American white pelican *Pelecanus erythrorhynchos*
Bank swallow *Riparia riparia*
Barrow's goldeneye *Bucephala islandica*
Black tern *Chlidonias niger*
Black-backed woodpecker *Picoides arcticus*
Black-throated sparrow *Amphispiza bilineata*
Blue grouse *Dendragapus obscurus*
Bobolink *Dolichonyx oryzivorous*
Brewer's sparrow *Spizella breweri*
Broad-tailed hummingbird *Selasphorus platycercus*
Bufflehead *Bucephala albeola*
Burrowing owl *Athene cunicularia*
Canada goose *Branta canadensis*
Chukar partridge *Alectoris chukar*
Cinnamon teal *Anas cyanoptera*
Cooper's hawk *Accipiter cooperi*
Ferruginous hawk *Buteo regalis*
Flammulated owl *Otus flammeolus*
Franklin's gull *Larus pipixcan*
Gadwall *Anas streperus*
Golden eagle *Aquila chrysaetos*
Grasshopper sparrow *Ammodramus savannarum*
Gray flycatcher *Empidonax wrightii*
Gray partridge *Perdix perdix*
Great gray owl *Strix nebulosa*

Greater sandhill crane *Grus canadensis*
Least bittern *Ixobrychus exilis*
Loggerhead shrike *Lanius ludovicianus*
Long-eared owl *Asio otus*
Mallard *Anas platyrhynchos*
Mountain quail *Oreortyx pictus*
Mourning dove *Zenaida macroura*
Northern bald eagle *Haliaeetus leucocephalus*
Northern flicker *Colaptes auratus*
Northern goshawk *Accipiter gentilis*
Northern harrier *Circus cyaneus*
Northern pygmy owl *Glaucidium gnoma*
Peregrine falcon *Falco peregrinus anatum*
Pileated woodpecker *Dryocopus pileatus*
Prairie falcon *Falco mexicanus*
Pygmy nuthatch *Sitta pygmaea*
Red-tailed hawk *Buteo jamaicensis*
Ring-necked pheasant *Phasianus colchicus*
Rough-legged hawk *Buteo lagopus*
Ruby-crowned kinglet *Regulus calendula*
Greater sage-grouse *Centrocercus urophasianus*
Sage sparrow *Amphispiza belli*
Sage thrasher *Oreoscoptes montanus*
Sharp-shinned hawk *Accipiter striatus*
Snowy egret *Egretta thula*
Spotted sandpiper *Actitus macularia*
Swainson's hawk *Buteo swainsoni*
Three-toed woodpecker *Picoides tridactylus*
Tundra swan *Cygnus columbianus*
Upland sandpiper *Bartramia longicauda*
Valley quail *Callipepla californica*
Western bluebird *Sialia mexicana*
Western burrowing owl *Athene cunicularia*
Western snowy plover *Charadrius alexandrinus*
White-faced ibis *Plegadis chihi*
White-headed woodpecker *Picoides albolarvatus*
Williamson's sapsucker *Sphyrapicus thyroideus*
Wilson's phalarope *Phalaropus tricolor*
Yellow-billed cuckoo *Coccyzus americanus*

Fish
Black bullhead *Ictalurus melas*
Black crappie *Pomoxis nigromaculatus*
Bridgelip sucker *Catostomus columbianus*
Brook trout *Salvelinus fontinalis*
Brown trout *Salmo trutta*

Bull trout *Salvelinus confluentus*
Channel catfish *Ictalurus punctatus*
Chinook salmon *Oncorhynchus tshawytscha*
Inland redband trout *Oncorhynchus mykiss* ssp.
Lahontan cutthroat trout *Oncorhynchus clarki henshawi*
Lahontan redside *Richardsonius egregius*
Margined sculpin *Cottus marginatus*
Pacific lamprey *Entosphenus tridentatus*
Rainbow trout *Oncorhynchus mykiss*
Redside shiner *Richardsonianus balteatus*
Smallmouth bass *Micropterus dolomieui*
Speckled dace *Rhinichthys falcatus*
Tahoe sucker *Catostomus tahoensis*

Invertebrates
Hotspring physa *Physella* sp.
Malheur cave amphipod *Stygobromus hubbsi*
Malheur pseudoscorpion *Apochthonius malheuri*
Planarian *Kenkia rhynchida*
River mussel *Margaritifera* sp.
Threeforks pyrg *Pyrgulopsis* sp.

Mammals
Antelope ground squirrel *Ammospermophilus leucurus*
Black bear *Ursus americanus*
California bighorn sheep *Ovis canadensis californiana*
California wolverine *Gulo gulo luteus*
Cougar *Felix concolor*
Fringed bat *Myotis thysanodes*
Kit fox *Vulpes macrotis velox*
Long-eared myotis *Myotis evotis*
Long-legged myotis *Myotis volans*
Mule deer *Odocoileus hemionus*
Pacific Townsend's big eared bat *Plecotus townsendii*
Big-eared bat *corinorhynis*
Preble's shrew *Sorex preblei*
Pronghorn antelope *Antilocapra americana*
Pygmy rabbit *Brachylagus idahoensis*
Rocky Mountain elk *Cervus canadensis*
Sagebrush vole *Lagurus curtatus*
Spotted bat *Euderma maculatum*
White-tailed jackrabbit *Lepus townsendi*
Yuma myotis *Myotis yumanensis*

Reptiles
Desert horned lizard *Phrynosoma platyrhinos*

Gopher snake *Pituophis catenifer*
Longnose leopard lizard *Gambelia wislizenii*
Mojave black collared lizard *Crotaphytus bicinctores*
Northern sagebrush lizard *Sceloporus graciosus*
Racer *Coluber constrictor*
Painted turtle *Chrysemys picta*
Short horned lizard *Phyrnosoma douglassi*
Side blotched lizard *Uta stansburianas*
Striped whipsnake *Masticophis taeniatu*
Wandering garter snake *Thamnophis elegans vagrans*
Western fence lizard *Sceloporus occidentalis*
Western ground snake *Sonora semiannulata*
Western rattlesnake *Crotalus viridis*
Western whiptail lizard *Cnemidophorus tigris*

Appendix I –Riparian / Wetland Areas and Assessment Methods

Riparian Assessment Methods

The quality of riparian productivity and diversity has been evaluated using two methods. One method, *long-term trend*, assesses trends in riparian health over time. The second method, *Proper Functioning Condition* (PFC), assesses condition of riparian function, which is a result of interactions between geology, soil, water, and vegetation (BLM Tech. Ref. 1737-9). In general, both assessment methods address physical as well as biological attributes and their interrelationships. These attributes include the abundance, structure, and diversity of riparian vegetation and the stability of streambanks.

Proper Functioning Condition Criteria
In response to growing concern over the integrity of ecological processes in many riparian and wetland areas, the BLM Director in 1991 approved the "Riparian-Wetland Initiative for the 1990's," establishing national goals and objectives for managing riparian/wetland resources on land administered by the BLM. The initiative's goals were to restore and maintain existing riparian/wetland areas so that 75 percent or more were in proper functioning condition by 1997, and to provide the widest variety of habitat diversity for wildlife, fish, and watershed protection. Subsequently, the BLM established a definition of PFC and a methodology for its assessment. The BLM has adopted PFC assessment as a standard for evaluating riparian areas and will use it to supplement existing stream channel and riparian evaluations and assessments.

PFC can be defined separately for *lotic* and *lentic* waters, as follows:

> *Lotic waters:* running water habitat, such as rivers, streams, and springs (BLM Tech. Ref.1737-9 and -15)

Lotic riparian areas are in *proper functioning condition* when adequate vegetation, landform, or large woody debris is present to:

- dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses; and
- support greater biodiversity.

Lentic waters: standing water habitat, such as lakes, ponds, seeps, bogs, and meadows (BLM Tech.l Ref. 1737-11 and -16).

Lentic riparian/wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:

- dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality;
- filter sediment and aid flood plain development;
- improve flood water retention and groundwater recharge;
- develop root masses that stabilize islands and shoreline features against cutting action;
- restrict water percolation;
- develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, water bird breeding, and other uses; and
- support greater biodiversity.

Because the functioning condition of riparian/wetland areas is a result of interaction of geology, soil, water, and vegetation, the process of assessing whether or not a riparian/wetland area is functioning properly requires an interdisciplinary team, including specialists in vegetation, soils, and hydrology. The team also requires biologists because of the fish and wildlife values associated with riparian/wetland areas. Because of unique attributes of individual riparian areas, site-specific and on-site assessments are necessary.

Riparian/wetland areas are classified as *functioning-at-risk* when they are in functioning condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation. These areas are further distinguished based on whether or not they demonstrate an *upward*, *not apparent*, or *downward* trend. PFC trend (apparent trend) should not be confused with long-term trend (see "Long-term Trend Data", below). PFC trend may incorporate long-term trend data if long-term trend was established prior to the PFC assessment. If long-term trend data are not available, then the Interdisciplinary Team must decide whether evidence exists at the site suggesting a trend in riparian condition. Evidence that supports an "apparent" upward trend determination includes presence of multiple age-classes of vegetation with reproduction. An apparent downward trend determination could be made where active channel downcutting or headcutting exist. Where stream reaches do not show strong apparent trend indicators the team will usually make a *trend not apparent* decision.

Riparian/wetland areas are classified as *nonfunctioning* when they clearly are not providing adequate riparian vegetation, physical structure, or large woody debris to dissipate stream energy associated with high flows. The absence of a particular physical attribute, such as a floodplain,

is also an indicator of nonfunctioning condition.

Riparian/wetland areas will function properly long before they achieve an advanced ecological status. The range between PFC and an area's biological potential then becomes the "decision space" for social, economic, and other resource considerations. Until PFC is attained, management priorities and options focus on reaching this threshold. Areas that meet PFC will be managed to assure a continuation of this condition and possibly for advanced ecological status.

Long-term Trend Data and Methods

Resource area specialists also evaluate riparian/wetland areas on the basis of trend information gathered from field studies. Trend is determined by collecting resource information at a given location at least two different times, then evaluating any changes over time. A variety of field study methods can be used to determine trend in riparian/wetlands (Table 8, Riparian Trend Indicators), including low-level infrared and true color imagery, line intercept vegetation transects, photo points, and aquatic invertebrate samples. When conducting trend studies site-specific resource values and watershed characteristics are used to design monitoring that is appropriate for each riparian area.

Trend evaluations factor in a site's *potential natural community,* the stable biotic community that would become established on an ecological site if all successional stages were completed without human disturbance under present environmental conditions. The potential of a site can vary with the location of the riparian area within the watershed. Several information sources are used to assess site potential.

Specific regional site-guides for determining potential natural communities have not been developed for riparian/wetland areas in southeastern Oregon. However, the BLM currently uses data collected at relatively pristine riparian "reference" areas to predict the potential natural community to be expected at a given site. These reference areas include riparian exclosures that have been in place since the 1970's and 1980's in the nearby Trout Creek and Oregon Canyon Mountains. When comparing plant communities from "reference" streams to those at an assessment site, allowances must be made for differences in flow duration, elevation, aspect, gradient, parent material, and adjacent channel conditions. Specialist and interdisciplinary teams have evaluated plant community composition in several reference sites to estimate potential for assessment sites in geographically associated streams. Additional information on riparian site potentials has been obtained from stream monitoring and study sites in allotments and pastures where livestock grazing practices were adjusted to meet objectives developed for riparian/wetland restoration. For example, an upward trend for herbaceous species (grasses, forbs, sedges, and rushes) is present when an increase in herbaceous cover is observed or when plant species composition changes from early-successional toward late-successional species.

Ecological Status of Riparian Vegetation and Proper Function Condition

Ecological status is the present state of vegetation of a range site in relation to the potential natural community for that site. One of the main goals of the BLM is to have riparian/wetland areas in proper functioning condition (PFC), and an overall objective of this goal is to achieve an advanced ecological status, except where resource management objectives, including PFC,

would require an earlier successional stage. This objective would provide the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection.

When evaluating riparian/wetland areas, ecological status should not be confused with PFC. Riparian/wetland areas must be viewed with the understanding that the riparian system is inherently dynamic and PFC can and will occur within any or all ecological stages. PFC is evaluated in terms of, and relationships to, all physical and biological functions occurring within the entire watershed, including the uplands and tributary watershed systems.

To comprehend how riparian/wetland areas operate and how management practices are implemented to ensure that an area is functioning properly, the capability and potential of a riparian/wetland area must be understood. Assessment of existing riparian vegetation condition and stream channel functionality is based upon a given riparian/wetland area's capability and potential. Here, *capability* is the highest ecological status a riparian/wetland area can attain given political, social, or economical constraints, whereas *potential* is the highest ecological status a riparian/wetland area can attain given no political, social, or economical constraints, often referred to as the potential natural community (see "Long-term Trend Data and Methods", above). Some riparian/wetland areas may be prevented from achieving their potential because of limiting factors such as human activities that alter the area's capability.

BLM depicts natural riparian/wetland areas as resources whose capability and potential is defined by the interaction of three components: (1) vegetation, (2) landform/soils, and (3) hydrology, while the functioning condition of these natural riparian/wetland areas are characterized by the interaction of these elements.

In the past, considerable effort has been expended to inventory, classify, restore, enhance, and protect riparian/wetland areas, but the effort has lacked consistency. No single classification, survey, inventory, or rating methods or systems have previously been developed to satisfy the complex interactions of healthy riparian/wetland areas. These areas are in dynamic equilibrium with streamflow forces and channel aggradation/degradation processes producing change with vegetative, geomorphic, and structural resistance. Ecological status determination of riparian/wetland vegetation does not necessarily take into account or address needed information that would be contained within aquatic habitat and stream surveys that is pertinent to the functionality of the riparian/wetland area. This is important because riparian/wetland areas will attain PFC long before they achieve an advanced ecological status.

Management of riparian/wetland areas is implemented to attain PFC as a first step to move habitat conditions of entire watersheds and/or their components that are comprised of uplands, streams, riparian/wetland areas, and lakes and ponds toward achieving terrestrial and aquatic objectives and attainment of Desired Range of Future Conditions (DRFC). Management practices such as grazing, mining, recreation, forest harvesting, and other forms of vegetation management would be designed for healthy sustainable and functional rangeland ecosystems as described in the 1997 "Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington" (Appendix B).

To summarize, PFC and ecological site status are two different characteristics of

riparian/wetland systems. A site in any ecological status may be in a proper functioning condition. Riparian/wetland areas should be judged on the functions that it provides compared to functions that should be present in relation to entire watersheds. All riparian/wetland systems should not be expected to have identical physical and biological functions. Riparian/wetland health (functioning condition), an important component of watershed condition, refers to the ecological status of vegetation, the geomorphic and hydrologic development, and the degree of structural integrity exhibited by the riparian/wetland area.

Riparian Management

In the past, many riparian/wetland areas were degraded by uncontrolled uses. Any management activity that disturbs water, soil, or vegetation can potentially degrade riparian areas. Such activities include livestock grazing, road construction, timber harvest, mining, irrigation, and recreation. In addition, activities that are off-site can affect riparian areas by influencing the timing and amount of overland and subsurface flow of water and movement of soils. Some past land use practices have resulted in riparian areas that (1) have inadequate vegetation to protect streambanks from erosion; (2) lack appropriate diverse vegetation that provides habitat for riparian-dependent wildlife species; (3) contain incised channels that do not allow streams to dissipate flood energy and provide water storage; and (4) provide inadequate pools and shade for aquatic species.

Not all potentially disturbing activities are incompatible with riparian area recovery or management, and not all riparian areas are equally susceptible to degradation. For example, livestock management that adjusts the timing and amount of grazing in riparian areas allows for improvement of riparian vegetation and development of streambanks and floodplains. The application of management practices needs to address requirements for vigorous and diverse riparian vegetation. A healthy riparian community can reverse channel degradation and provide habitat for associated wildlife. In some areas where management has been changed, proactive restoration may be required to slow or reverse physical processes causing channel degradation or to initiate natural recovery of a riparian area. Restoration may include activities such as building structures for headcut stabilization or planting cottonwood or willow species when no natural source exists.

Appendix J – Landscape Appearance Photo Series
Louse Canyon Geographic Management Area

JORDAN RESOURCE AREA, VALE DISTRICT, BUREAU OF LAND MANAGEMENT
SUMMER/FALL : YEAR 2000 : RANGE HEALTH ASSESSMENT IMAGES

Photo Number	**Vegetation Type**	**Allotment / Pasture**	**Upland Elevations in Feet**
101	Wyoming big sagebrush	Anderson / North	5,180
102	Wyoming big sagebrush	Louse Canyon / Drummond Basin	5,040
103	Wyoming big sagebrush	Anderson / Spring	5,180
104	Wyoming big sagebrush	Anderson / Spring	5,180
105	low sagebrush / Wyoming sagebrush transition	Louse Canyon / Louse Canyon	5,950
106	Wyoming big sagebrush	Campbell / Horse Hill	5,600
107	Wyoming big sagebrush	Anderson / North	5,020
108	Wyoming big sagebrush	Star Valley / North Tent Creek	5,140
109	Wyoming big sagebrush	Star Valley / Tri-state	5,370
110	crested wheatgrass seeding	Campbell / Starvation Seeding	5,375
111	crested wheatgrass seeding	Louse Canyon / Pole Creek Seeding	5,300
112	Wyoming big sagebrush	Campbell / Starvation Brush Control	5,375
113	Wyoming/mountain big sagebrush and low sagebrush communities co-mingled	Louse Canyon / Louse Canyon	5,880
114	low sagebrush reference (baseline)	Campbell / Horse Hill	6,040
115	basin big sagebrush	Star Valley / South Tent Creek	5,280
116	Riparian/wetland	Bell Spring / Campbell	
117	Riparian/wetland	Bend Spring / Louse Canyon	
118	Riparian/wetland	Cairn Spring / Star Valley	
119	Riparian/wetland	Exchange Spring / Louse Canyon	
120	Riparian/wetland	Indian Spring / Louse Canyon	
121	Riparian/wetland	Big Antelope Creek / Campbell	
122	Riparian/wetland	Jack Creek / Louse Canyon	
123	Riparian/wetland	Owyhee River – main stem	

Photo Number	**Vegetation Type**	**Allotment / Pasture**	
124a	Riparian/wetland	Three Weeks Spring / Louse canyon	
124b	Riparian/wetland	Deer Creek / Louse Canyon	
125	Riparian/wetland	Big Antelope Creek – lower reach / Campbell	
126	Riparian/wetland	Big Antelope Creek – aspen stand / Campbell	
127	Riparian/wetland	Dry Canyon	
128	Riparian/wetland	Tent Creek / Star Valley	
129	Riparian/wetland	Jack Creek / Louse Canyon	
130	Riparian/wetland	Tent Creek / Star Valley	
131	Riparian/wetland	Tributary to Tent Creek / Louse Canyon	
132	Riparian/wetland	Bobs Draw / Louse Canyon	

Photo 101

Photo 102

Photo 103

Photo 104

Photo 105

Photo 106

Photo107

Photo 108

Photo 109

Photo 110

Photo 111

Photo 112

Photo 113

Photo 114

Photo 115

Photo 116

Photo 117

Photo 118

Photo 119

Photo 120

Photo 121

Photo 122

Photo 123

Photo 124a

Photo 124b

Photo 125

Photo 126

Photo 127

Photo 128

Photo 129

Photo 130

Photo 131

Photo 132

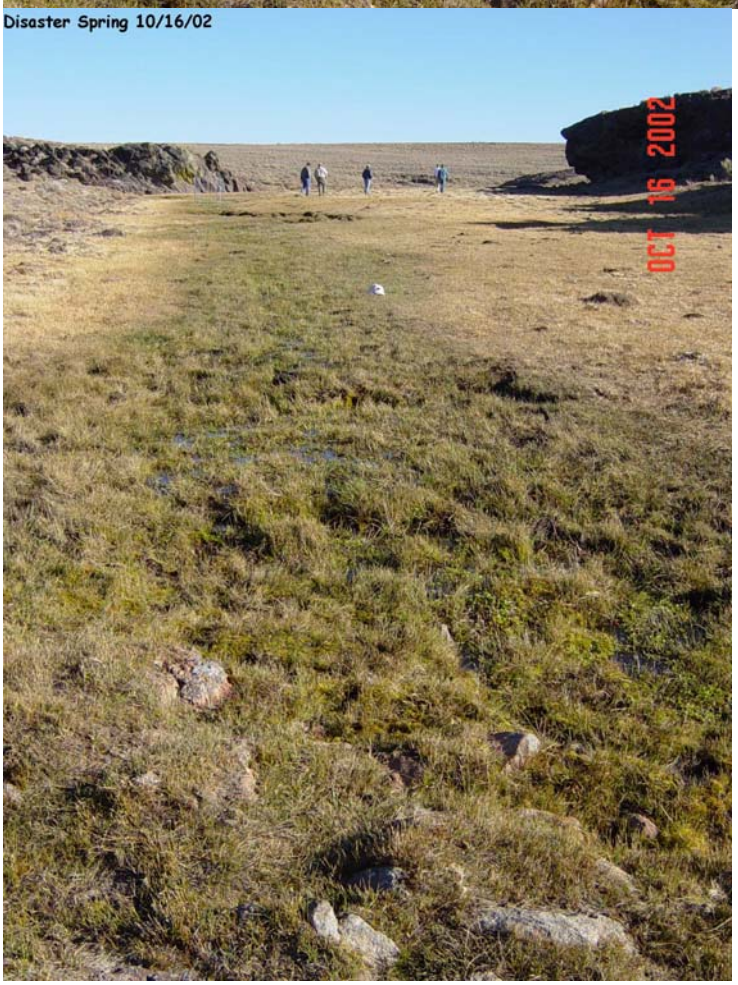
Appendix K
Disaster Spring - Interim Grazing Monitoring Photos

Disaster Spring 9/5/02

Disaster Spring 9/18/02

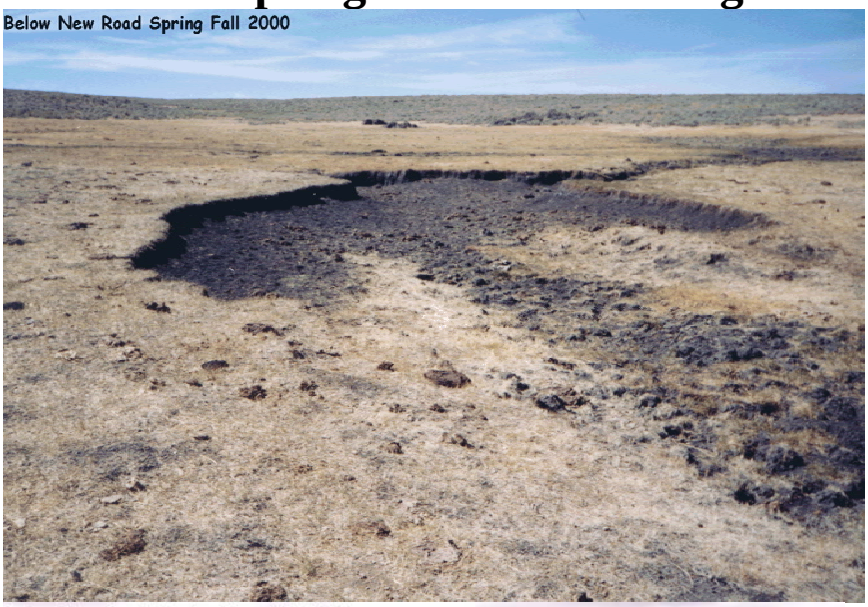
Disaster Spring 10/07/02

Disaster Spring 10/16/02
OCT 16 2002


Disaster Spring 10/16/02
OCT 16 2002

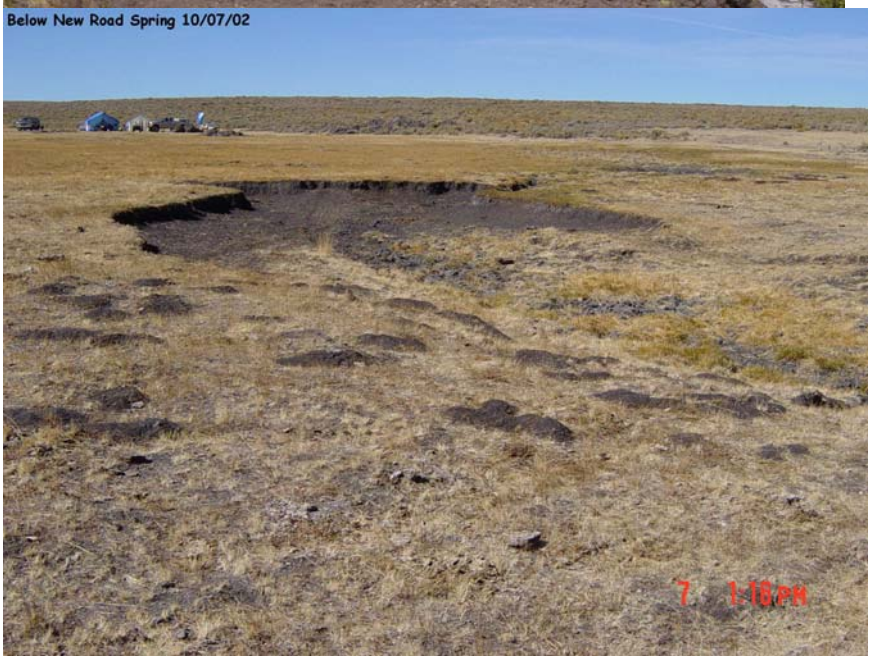
New Road Spring - Interim Grazing Monitoring Photos

Below New Road Spring Fall 2000



Below New Road Spring June 18, 2002

Below New Road Spring 10/07/02



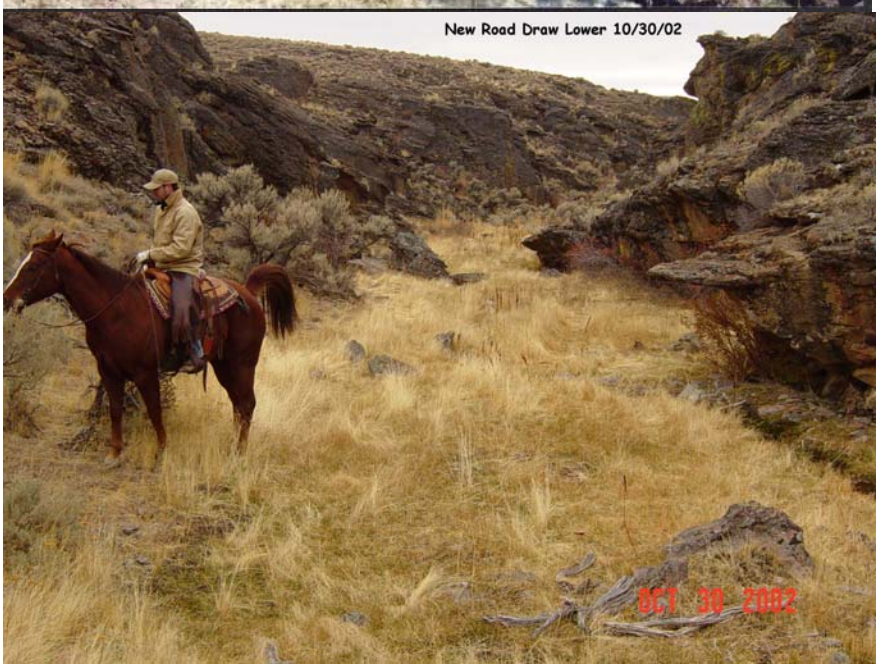
New Road Spring 11/15/01

New Road Spring 10/07/02
7 2:12 PM

New Road Draw Upper Fall 2000

New Road Draw Upper 10/30/02
OCT 30 2002

New Road Draw Lower Fall 2000


New Road Draw Lower 10/30/02
OCT 30 2002

New Road Draw Middle Fall 2000

New Road Draw Middle 10/30/02
OCT 30 2002

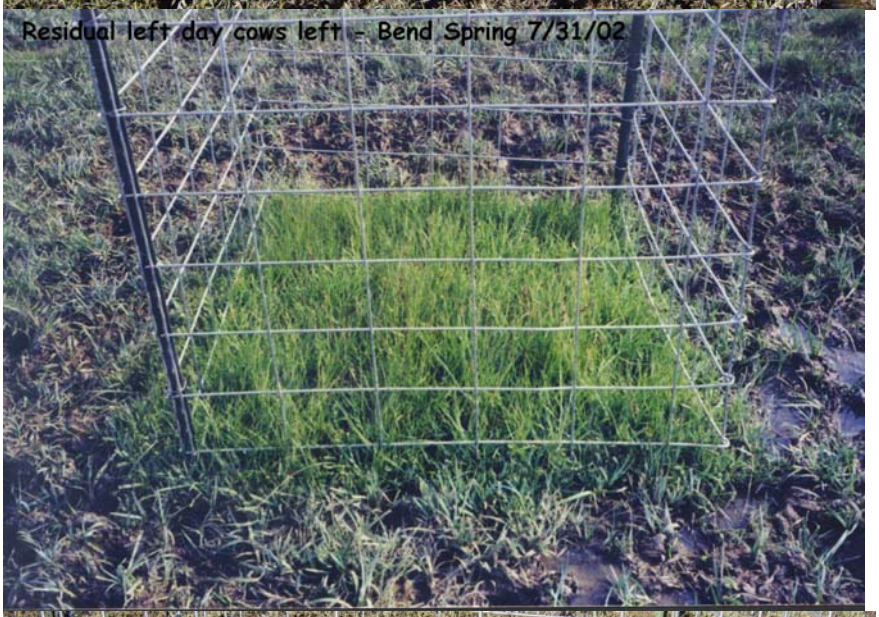
Bend Spring - Interim Grazing Monitoring Photos

Bend Spring 11/14/01

Bend Spring 5/15/02

Bend Spring Facing East 7/31/02 Cows being trailed home today by Nouque Ranch.

Bend Spring 10/07/02 - Trespass Horses in the area.
7 5:01 PM


Residual left day cows left - Bend Spring 7/31/02

7 5:01 PM
Bend Spring 10/07/02 - Trespass Horses still in surrounding area.

Deer Creek - Interim Grazing Monitoring Photos

Deer Creek 7/31/02

Deer Creek 10/07/02
7 4:16PM

Deer Creek 10/16/02 - Trespass horses in area.
OCT 16 2002

Cairn Spring - Interim Grazing Monitoring Photos

Cairn Spring 11/2001 - Source after grazing.

Cairn Spring 7/31/02 - Spring Source

Cairn Spring 10/7/02 - Source after all grazing has ceased

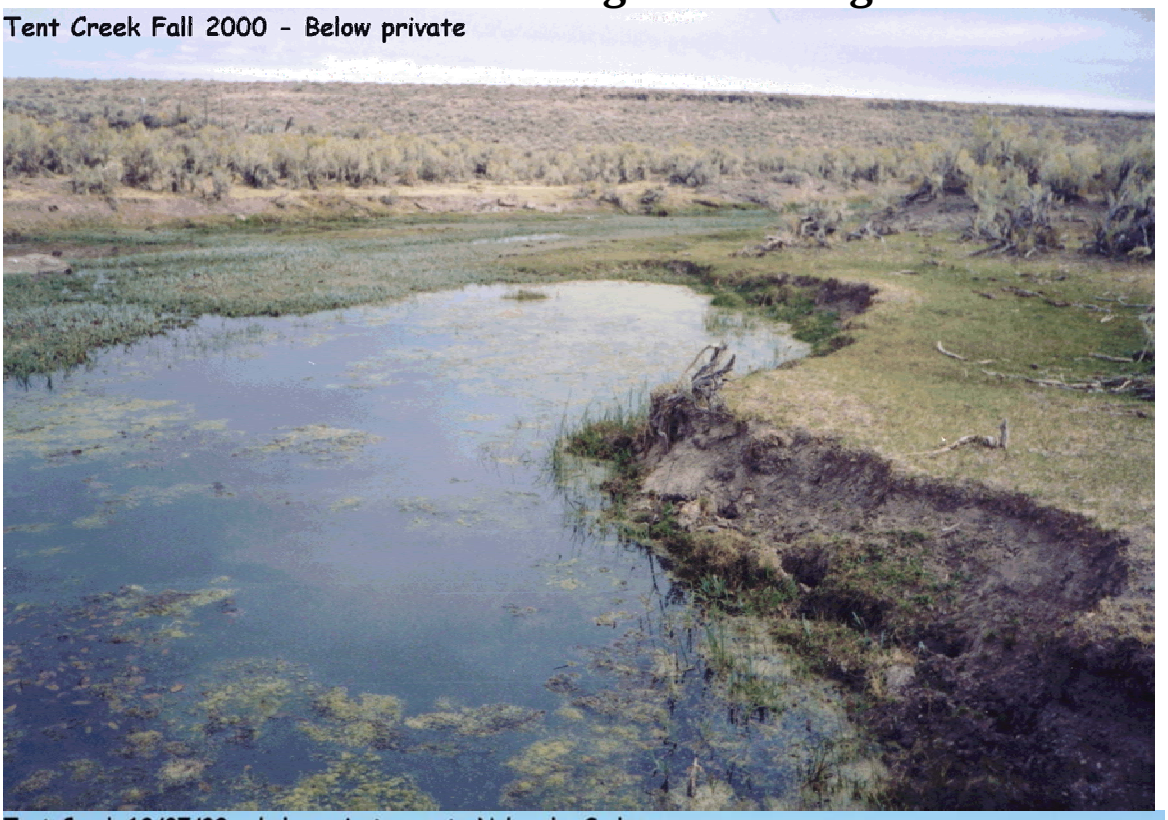
Cairn Spring 11/2001 - After grazing

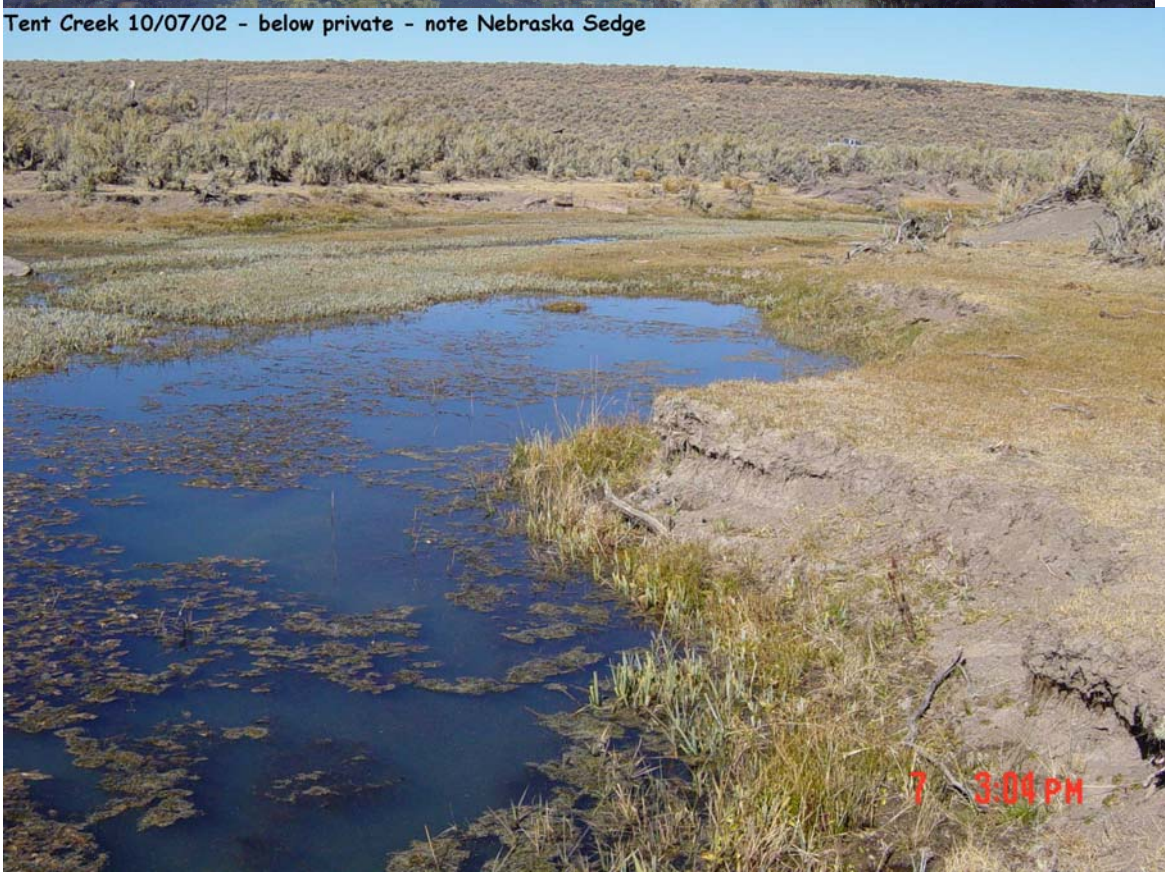
Cairn Spring 7/31/02

Cairn Spring 10/07/02 - After grazing.

SEP 26 2000

Tent Creek - Interim Grazing Monitoring Photos





Tent Creek 7/31/02

Tent Creek 8/27/02
AUG 27 2002

Tent Creek 10/7/02 - after grazing
7 2:50PM