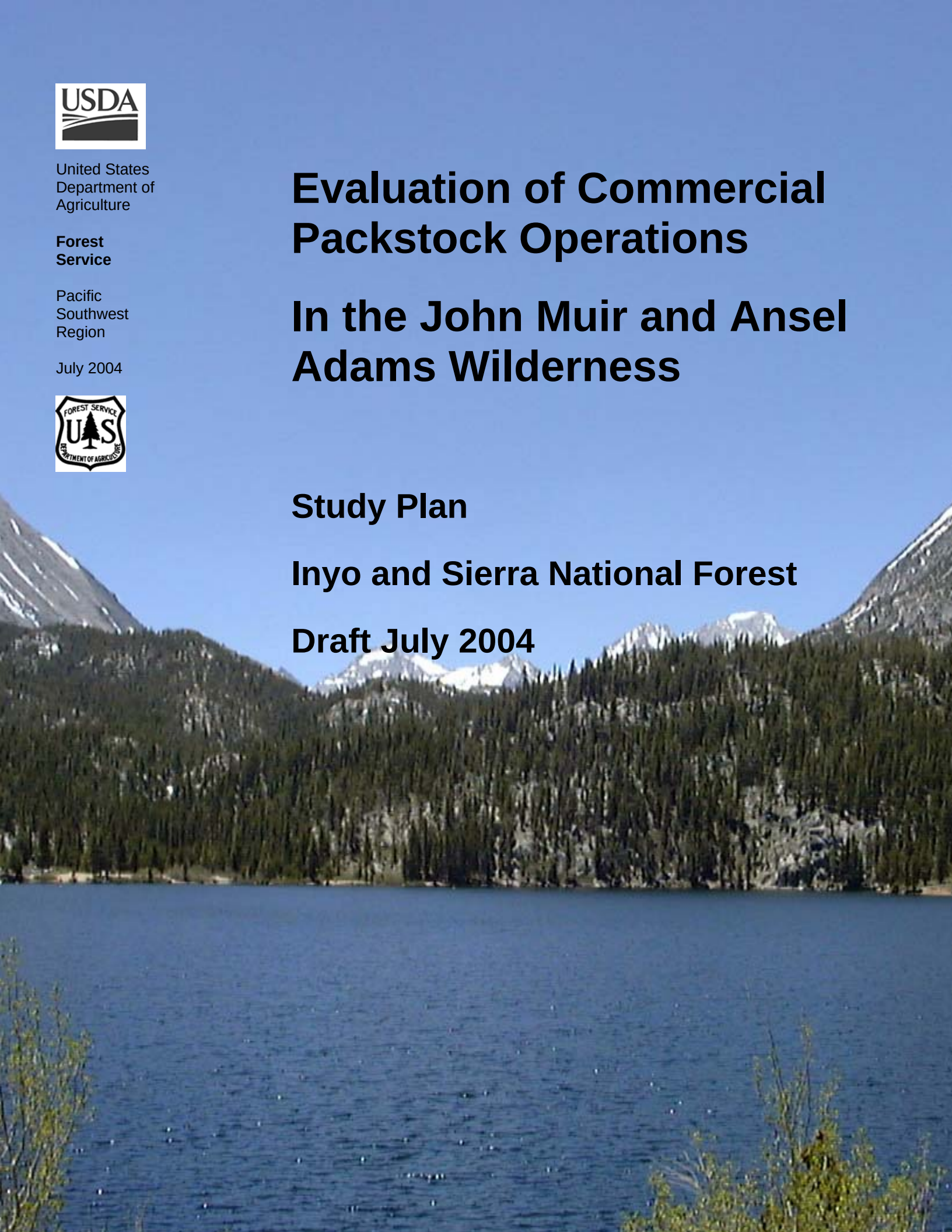

United States
Department of
Agriculture

**Forest
Service**

Pacific
Southwest
Region

July 2004

Evaluation of Commercial Packstock Operations

In the John Muir and Ansel Adams Wilderness

Study Plan

Inyo and Sierra National Forest

Draft July 2004

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Section 1 – Purpose

The primary purpose of this study plan is to design our approach for responding to the Northern California District Court's injunctive relief issued in January 2002. This decision requires a cumulative impact analysis completing the NEPA process for site specific reissuance of commercial packstock special use permits on the Inyo and Sierra National Forest. The geographic scope of this analysis is the John Muir and Ansel Adams Wildernesses on the two Forests. The court order states:

> The Forest Service shall complete the NEPA process analyzing the cumulative impacts of packstock operation. In conducting the cumulative impacts analysis, the Forest Service shall consider limits on numbers of stock animals used in conjunction with commercial operators; limits on group size (both number of people and number of stock both on and off trail); trail suitability for various use types; and designation of campsites for use by commercial pack stations.

Section 2 – Objectives

1. To assemble all existing information relevant to packstock operations, in the form of operating activities, literature review, and any existing data on ecological or social resources in the Ansel Adams and John Muir Wilderness.

2. To assess, on-the-ground, approximately 60-75% of the areas used by commercial packstock in the Ansel Adams and John Muir Wildernesses through site visits to the critical areas of operation by the Interdisciplinary (ID) team. These critical areas will be the highest use areas and the areas where multiple operators operate. As a control, some of areas where either very light commercial use is occurring and/or no commercial use is occurring will also be visited. While the ID team is conducting an extensive assessment, technicians will conduct more intensive inventories where more information is needed than is provided by the extensive inventory. The remaining areas will be assessed by making extrapolations from the on-the-ground assessments, aerial photographs, or some other means.

3. To provide a baseline of information relevant to wilderness management and the administration of commercial packstock operations on the Inyo and Sierra National Forests. This baseline data will inform management of compliance with existing LRMP standards and guidelines and develop potential management actions needed to facilitate compliance with LRMP and facilitate commercial operations on the Forest to meet public needs.

4. To have adequate and representative geographic data and information to respond to the court order requiring our assessment of limitations on numbers of stock, group size, trail suitability, and campsite designations.

Section 3 – Methodology

An interdisciplinary team of specialists was selected for this project by management from the Inyo and Sierra National Forests. A core team from the Inyo NF was identified to be the primary

team that would conduct the field work, analysis, and documentation. An expanded team made up of staff from the Sierra NF was identified to provide support to the core team in the form of providing existing data and conducting any intensive inventory on the lands administered by the Sierra NF.

In developing an analysis strategy and methodology, staff and management from both the Sierra and Inyo National Forests reviewed the court order, current wilderness monitoring strategy, and needs for pack station special use permit re-issuance (site specific analysis). A list of key questions for the analysis was created and provides some of the initial framing of the analysis. This is listed below under Data Needs Assessment (Table 1). The needs assessment was then used to determine what survey tools and design the analysis required (Table 2).

Over the course of the three years of site visits and through observed patterns and ranges of conditions that can only be experienced by such visits, the team gradually honed in on the key elements and refined the approach. After each season we carefully adjusted information from previous years to assure consistency. Data forms evolved and streamlined the data collection process over time.

Table 1: Date Needs Assessment Key Questions and Data Needs

Key Questions	Data Needs
Where are operators activities occurring, what type of activities are occurring and where are they concentrated ?	Pack Station Tally Sheets (2001-2003)
Where are operators grazing and at what level?	Pack Station Grazing Card Data (2001-2003)
What is the current condition of the meadow/riparian features?	Synthesis of Proper Functioning Condition (PFC – Protocol in Appendix E), meadow attribute assessment and suitability analysis (Protocol in Appendix E), Key Area Benchmark Vegetation analysis, Stream Condition Inventory (SCI), legacy data; biologist/botanist field review and initial survey for key species and habitats presence/absence during IDT trips, noxious weed inventory
Are the grazing areas identified by packstations suitable for grazing?	Suitability assessment (a synthesis of meadow attribute assessment and suitability analysis), PFC
Is meadow condition within resource desired conditions?	Synthesis of PFC, meadow attribute assessment and suitability analysis, Key Area Benchmark and Vegetation analysis, SCI, legacy data

Key Questions	Data Needs
What is the current condition of stream and spring channel geomorphic characteristics?	PFC (Qualitative), SCI(Quantitative), legacy data, meadow attribute assessment, hydrology/soil evaluation
What are the observed direct, indirect, and cumulative effects of operator activities on TESP and MIS species and their habitat, fens and bogs, noxious weeds?	Biologist/botanist professional qualitative evaluation and documentation of observed direct, indirect, and cumulative effects of packstation activities at specific meadows, trails, and campsites. Categorization of management concern over observed effects to species or habitat. Assessment of need for additional, or protocol survey. See Appendix C and D for species considered and survey and assessment categories. Weed risk assessment.
What are the anthropogenic impacts on significant heritage sites? Impacts include destruction of structures and features, disruption of spatial relationships and subsurface stratigraphy, illegal collection, vandalism. Destruction of paleoenvironmental data, e.g., fens.	Heritage site location, condition, and National Register of Historic Places significance. Other information includes proxy data, condition of fens, erosion indicators, vegetation cover, stream bank
What are the anthropogenic impacts on traditional Native American values and uses?	To be determined in consultation with the affected tribe(s) on a locality specific basis.

Key Questions	Data Needs
What is the current condition of each system or non-system trail and what are the effects of the trail on resources?	Trail assessment (Overall Resource Rating), using Trail Assessment Form and Trail Assessment Protocols. Biologist/botanist field review and initial survey of key species and habitats presence/absence during IDT trips. Noxious weed inventory, heritage concerns, soils/hydrology evaluation.
What are the appropriate use types of both system and non-system trails? Is trail capable of handling commercial packstock use?	Assessment of trail stability and risk factors in the trail vicinity, using Trail Assessment Form and Trail Assessment Protocols. Biologist/botanist, soils/hydrology professional qualitative evaluation and documentation of observed direct, indirect and cumulative effects of packstation activities at specific meadows, trails and campsites. Heritage sites, treatments necessary to mitigate impacts
What mitigation is necessary to stabilize each non-system trail for continued use as a stable use-trail or as a system trail?	Types and intensity of treatments needed for maintaining a stable trail with existing and anticipated uses. Assessments made through professional judgment of trails specialist and soils/hydrology specialists. Evaluate whether stability can be readily accomplished on non-system trails with incidental treatments that do not require system-trail type development.
How is each trail being affected by packstock use? (Trail facility/infrastructure).	Current condition of trail Use levels – past use, existing and expected future use. Timing of commercial packstock use. Conditions that make packstock use impractical or unsafe. Risk Factors in the trail corridor. Deferred maintenance and annual maintenance needs.

Key Questions	Data Needs
What system trails are suitable for commercial stock use?	Desired condition of the destinations accessed (Recreation Category, resource limitations or other non-trail factors). Identification of presence of risk factors and trail development concerns that would make the trail impractical to maintain to stock standard. (resource/safety considerations)
What Trail Class should each system trail be designated? (Including use trails added to the system).	Consistency with Plan direction – recreation categories defined in 2001 Wilderness Plan. Trail development level needed to sustain current or expected use types and levels and maintain trail stability. (Current condition and risk factors, as determined in Trail Assessment). Expected intensity of development and future maintenance needs.
Prescription – what work is necessary to make each trail stock suitable?	Relative levels of work: Reconstruction to meet stock standards at designated Trail Class development Maintenance work needed to meet stock standards at designated Trail Class development
How does the designation of a trail corridor as a Traditional Cultural Property affect trail management?	To be developed in consideration of the specific heritage and/or traditional cultural values found on the trail. Development of a formal Programmatic Treatment Plan when inventories are completed is recommended. Section 106, Consultation.
Would designated campsites sites reduce impacts?	Quantity, location, type, condition
Are there appropriate party size limits?	camping potential/impacts from destination attribute protocol
Are campsites contributing to unacceptable soil and watershed conditions?	Soil compaction, loss, erosion, Best Management Practice's consistency with Water Quality Orders from Water Quality Control Boards (Lahontan + Central Valley); Water quality (currently not collecting),

Key Questions	Data Needs
Are campsites and access to them contributing to unacceptable biological conditions?	Assessment of camp access trails as use trails. Biologist/botanist professional qualitative evaluation and documentation of observed direct, indirect and cumulative effects of packstation activities at specific meadows, trails and campsites. Noxious weed identification
What operator practices are having adverse impacts on physical, biological, heritage, resources?	Input from operators on current practices Biologist/botanist professional qualitative evaluation and documentation of observed direct, indirect and cumulative effects of packstation activities at specific meadows, trails and campsites. Input from wilderness rangers
Are there streambank disturbances associated with campsites or access to them?	Streambank alteration, PFC, BMP's
Are there streambank disturbances associated with grazing activities in meadows/riparian?	Streambank alteration, PFC, meadow attribute assessment
How does "proposed action" (packstock operations) affect water quality?	consistency with WQO from WQCBs' (Lahontan + Central Valley); Water quality (currently not collecting)
What effect would having more or less people (party size) have on the condition?	Biologist, botanist, heritage, wilderness input.
What would happen with more or less stock on the site?	Biologist, botanist, heritage, range, wilderness input.
Is the area meeting the recreation category desired condition?	Wilderness, destination table.
Are there restoration activities needed to ensure packstock use is maintained within standards and guidelines?	Meadow attribute assessment and suitability assessment, hydrology/soils/range field evaluation.
Are there capacity limits at camp locations?	Wilderness evaluation

Survey Tools and Design

The following survey tools were identified to acquire data based on needs described above. Focusing on the features of packstock operations, and the data needed to answer key questions for decision making, survey tools were identified, designed, and modified and refined over the course of the study. This table tracks this process.

Table 2: Survey Tools

Features	Survey Tools	Design	Complete
Riparian Zones (including Critical Aquatic Refuges)	Proper Functioning Condition (PFC) Stream Condition Inventory	Professional assessment and documentation by IDT of PFC. SCI reaches identified and prioritized by IDT for later evaluation.	Yes
Meadows (Subset of Riparian)	Meadow Attribute Table (Grazing capability, suitability, and potential carrying capacity) Proper Functioning Condition	Professional assessment and documentation of existing condition, suitability, and carrying capacity estimates by specialists using Meadow Attribute Table (see Packstock Management Guide, Appendix G, page 11), using Meadow Attribute Assessment, PFC	Yes 2001 Revised 4/03
Grazing Key Areas (Subset of Meadows)	Establishment and Assessment of Packer Use Area Benchmarks Proper Functioning Condition Stream Condition Inventory Benchmark Vegetation Transects, Greenline Transects (see R5 rangeland Analysis and Planning Guide, March 1997).	Professional assessment and suitability assessments by specialists (Wilderness Plan, Packstock Management Guide, Appendix G, pages 7-8, 11), leads to identification of key areas for more detailed surveys.	Yes

Features	Survey Tools	Design	Complete
Fens (subset of Riparian)	Botanical surveys with soil and hydrology components.	Professional assessment of hydrology, soils, and plants by specialists, including organic soil depth and species composition, including PFC (lentic).	Ongoing through 04
Heritage Resources	1) Input on trails, destinations and campsites 2) Inventory 3) Site condition monitoring by or under the direction of a Heritage Resources Specialist 4) Proxies (erosion, etc.)	Pedestrian survey; standardized monitoring observations. Proxy data from appropriate specialist	Yes

Features	Survey Tools	Design	Complete
Threatened Endangered Proposed Sensitive, and Management Indicator Species	1) Yosemite Toad (YT), mountain yellow-legged frog (MYLF) presence/absence surveys 2) Office review and map preparation of known locations and suitable habitat of YT, MYLF 3) Goshawk, great gray owl, willow flycatcher, California spotted owl, bald eagle and Lahontan cutthroat trout known locations and GIS habitat layers, if available 4) Additional non-packstation use area surveys as time and money permit 5) Literature review of scientific papers concerning habitat reqirements and management effects to species and habitat 6) Surveys for TES plant species and their habitats	Professional assessment of habitats and potential impacts with possible follow-up protocol or lesser standards depending on need to correlate use packstation impacts to species willow flycatcher, great gray owl, northern goshawk, California spotted owl, bald eagle, Lahontan cutthroat trout presence/absence. Regional Protocol survey for Yosemite toad and mountain yellow-legged frog. GIS map of suitable and occupied habitat and known locations for YT. Field crew surveys for yellow-legged frog. Professional interdisciplinary field evaluation and documentation of effects to species and habitat components. Professional assessment of potential impacts on FS Sensitive Plants and their habitats. Complete botanical surveys done in areas of high concern.	Yes
Invasive Plants	Surveys for Non-native invasive plants	Professional survey of use areas and packstations, weed risk assessment (SNFPA)	Yes

Features	Survey Tools	Design	Complete
Use Trails	1) Condition Inventory 2) ID Team Assessment, using Trail Assessment form.	1) Inventories, including GPS location, and assessment using Use Trail Assessment Protocols by trained technicians. 2) Professional assessment in field by ID Team, evaluating effects to wildlife, botany, soils, hydrology, heritage.	1)Yes 1999 Revised 2001 2) Yes 2002 Revised 2003,
System Trails	1) ID Team Field assessment, using Trail Assessment form and System Trail Protocols 2) Trail Survey and Prescription Logs	1) Professional assessment in field by ID Team, evaluating effects to wildlife, botany, soils, hydrology, heritage. 2) Assessment of trail condition, including coarse evaluation of resource impacts by trained data collector. Information used in assessing trails not visited by full IDT.	1)2001, revised 2003 2) Yes, 2000
Campsites	Best Management Practice Compliance	Professional assessment by Hydrologist using Best Management Practices Evaluation Program (BMPEP) Region 5 protocols (BMPEP form 23; packstock facilities in wilderness) to evaluate campsite impacts to nearby water bodies and water quality.	Yes, ongoing through ‘04
	Campsite Condition Assessment		No
Destination	Destination Assessments	Integrate specialist ratings of conditions at each identified destination. Design Protocol	Yes 6/02 Revised 3/03

Section 4 – Approach

Site Visits

- Complete a GIS coverage, from packer information, that displays which areas each pack station uses. Map all trails, routes, camps, grazing areas, drift fences, and any other features or items that may need to be assessed by the ID team such as where operators wish to sand.
- Design ID team field trips to visit all sites within the high priority areas. High priority areas are places where more than one operator uses, the over-the-crest areas, and areas of high visitor use. Site visits are designed to assess as many grazing areas, destination areas, trails and use trails as possible that an operator has identified.
- In addition to the high priority areas, some areas not recently used by stock (such as Mildred, Cloverleaf, Laurel lakes) were visited to help establish a baseline for comparison of alternatives. This will be used for comparative purposes and for purposes of making some assumptions about the overall condition of the wilderness in the context of a cumulative effects analysis.

Extensive Assessments

The ID team will conduct an extensive, broad condition assessment for components mentioned below. Forms and protocol have been developed based on the needs assessment and the survey tools and design needs identified. The ID team systematically observes and records attributes associated with the following assessments using these forms and protocols:

- Meadow Assessment (which includes the Suitability Assessment and Estimate of Carrying Capacity) for all areas identified for grazing; the BMP Evaluation for campsites and stockholding areas; and the Proper Functioning Condition (PFC). The PFC assessment method was developed by the BLM and published in Process for Assessing Proper Functioning Condition (U.S. Dept. of Interior, 1993). The IDT uses this document along with A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (U.S. Dept. of Interior 1998). It is a qualitative assessment of the physical functioning of riparian and wetland areas based on consideration of hydrology, vegetation, and soil/landform attributes. The assessment is done by an interdisciplinary team including specialists in vegetation, soils, and hydrology.
- Destination/Basin Assessment Form
- System and Use Trail Assessment

For each of the above, rating systems have been or are being developed to standardize the information. Protocols can be found in Appendix E.

In addition each specialist is responsible for observations and collection of pertinent information in the field that will be documented in trip-by-trip specialist reports.

Intensive Inventory/Survey Work

For some features and areas intensive inventory work is identified. This is conducted by the professional specialists or technicians that are trained in the use of the protocol. Intensive inventory includes:

Stream Condition Inventory

Stream Condition Inventory (SCI) is an extensive survey method that will be used to quantify packstock effects on geomorphic processes and aquatic habitat. The IDT has identified and stratified area suitable for SCI over the last several years, and SCI surveys will be completed in a small number of high priority areas for continued monitoring to determine stream condition trend.

Threatened, Endangered, Proposed, Sensitive, and Management Indicator Species

- Sierra Nevada bighorn sheep is the only federally listed endangered wildlife species within the analysis area. Commercial packstation operations are not considered to affect bighorn sheep since packstation operations typically occur in lower elevation in gentle to moderate topography areas outside the majority of sheep habitat use areas. The California Department of Fish and Game (CDFG) is involved in an intensive inventory and monitoring effort of all sheep populations in the Sierra including the use of radio-telemetry to track sheep movements. CDFG has not identified specific concerns related to commercial packstation operations and bighorn sheep at this time. This analysis will rely on CDFG monitoring data.
- Yosemite toad (Sensitive): Prefield survey work involves the identification of suitable habitat using aerial photo analysis and the assessment of known locations from historical observations and other databases. Survey crews are then sent to the field to conduct a one-time search of suitable habitat for presence of the species within identified commercial packstock grazing areas. The Interdisciplinary Team is also trained in the identification of Yosemite toads and their habitat and also records observations of toads when conducting field trips for assessment of campsites, trails, and grazing areas. California Department of Fish and Game database is also used to supplement survey information and to identify Yosemite toad known locations.
- Mountain yellow legged frog (Sensitive): Mountain yellow-legged frog are searched for during Yosemite toad surveys in meadow streams and meadow edges of lakes where commercial packstock grazing has been identified. Concurrent surveys are also occurring by the California Department of Fish and Game focusing heavily on lakeshore and stream habitats. The Interdisciplinary Team is trained as well in the identification of mountain yellow-legged frogs and their habitat and also records observations of frogs when conducting field trips for assessment of campsites, trails, and grazing areas
- Northern goshawk (Sensitive): The probability of this species occurring in the packstation analysis area is high. Occular surveys by biologists and trained technicians will be conducted to look for nests along trail corridors in suitable habitat generally in the mixed conifer and lodgepole pine habitats below 10,600 feet. Tape recorded goshawk calls will be played around a sample of camps in highly suitable habitat to detect goshawk presence and to determine if there is a need for follow-up

nest searching. The Northern goshawk survey protocol will be part of the project record.

- Great gray owl (Sensitive): The probability of great gray owl nesting and occupancy is very low within the packstation areas of operation since most of the analysis area is above 8,000 feet in elevation that has been determined from previous Sierran survey work to be an upper elevational cut-off for the majority of known great gray owl breeding activity. Surveys using Region 5 protocol (USFS 2000) will be conducted in highly suitable habitat on the west slope of the Sierra where grazing areas and packer camps are in close proximity to this habitat. It is anticipated the survey will encompass a very small area on the Sierra National Forest and require a very limited effort. The survey protocol for the Great gray owl will be included in the project record.
- Willow flycatcher: The probability of this species occurring within the area of packstation operations is very low. No suitable habitat polygons have been identified in any habitat assessment effort prior to the CEA analysis. The CEA field trips and aerial photo analysis will be used to assess where a Region 5 protocol survey effort may be needed. It is anticipated to be a few meadows, if any, generally below 8,000 greater than, but not limited to 15 acres in size with a robust willow component of tall, patchy shrub clumps greater than 6 feet in height. The Willow flycatcher survey protocol for California will be included in the project record.
- Forest Carnivores (American marten, Pacific fisher, California wolverine, Sierra Nevada red fox): No surveys will be conducted for the marten and fisher since they are wide-ranging and generally not affected by packstation operations. Adverse effects to their habitat associated with packstation operations are unlikely. The fisher is generally found below the majority of packstation operations that occur on the Sierra National Forest. The marten is common in suitable habitat and highly tolerant of human activity in wilderness. Wolverine and Sierra Nevada red fox have not been observed in the Sierra for over 20 years, survey efforts have failed to detect the species to date and therefore any survey effort with the limited time and money available would be unlikely to yield results that would contribute to the CEA.
- California spotted owl: No survey is recommended other than to describe where suitable habitat may occur during the IDT trip visits. The species is nocturnal, has a very large home range, and inhabits lower elevation wilderness where packstation operations generally do not occur, and even if they did, would likely have no effect on this species use of the wilderness.
- Bald Eagle and other raptors on the MIS list such as golden eagle, peregrine falcon and prairie falcon: No survey effort will occur. Observations will be noted during the course of the IDT trips and field surveys. Additional follow-up survey may occur if specific issues are identified with an area of overlap between these species and packstation operations. No nesting pairs are known within the packstation operating areas.
- Complete surveys of sensitive plant populations will be done in areas where there are observed negative impacts from packstock use. Monitoring of number of plants and extent of population will be set up in these areas.

Benchmark Vegetation Analysis

Initial determination of Benchmark Key Areas, 68 sites, was done during the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses Environmental Impact Statement process (see Wilderness Plan, Appendices E, F, and G). During the extensive surveys the interdisciplinary team identified Benchmark Key Areas to be scheduled for intensive survey from among the pool of these areas determined to be suitable for grazing allocation. Areas were selected based on the site's ability to provide knowledge relative to known resource issues, anticipated or known packstock use levels, and/or based on the representative nature of the site.

Initially, the Rangeland Management Specialist and Botanical Specialist attempted to accomplish vegetation frequency transects concurrently with site visits and the extensive surveys by the interdisciplinary team. Due to the time required and the need of the interdisciplinary team to accomplish extensive level survey of many sites spread over a large area, the interdisciplinary team determined that the intensive level of surveys would have to be accomplished separately by teams dedicated to that purpose. The protocol is available from the Rangeland Analysis and Planning Guide (USFS, March, 1997).

Carrying Capacity

The interdisciplinary team determined that it would be useful to estimate a carrying capacity, expressed in stock nights, for those areas determined to be suitable for grazing. Four categories of suitability were identified: 1) The area is suitable for allocation to a commercial packstock operation over a large portion of the meadow; 2) the area is partially suitable over some of the meadow, with major areas unsuitable; 3) the area is not suitable for allocation to a commercial packstation, but may be suitable for non-commercial, and limited, grazing; and 4) the area is not suitable for grazing.

The packstock management guide identifies allowable utilization factors for suitable areas—in most cases either 30 percent or 40 percent by weight—for a montane or a subalpine meadow. The allowable utilization factor is based on determining if the meadow is in a high or a low to moderate seral ecological state (Wilderness Plan, Appendix G, page 4) following benchmark data collection and analysis. If the vegetative composition of an area was observed to be shifted to low-seral vegetation over more than one third of the area, the initial allowable utilization factor is set at 30%, otherwise it is set at 40%, for herbaceous vegetation in montane meadows determined to be suitable. The allowable utilization levels may be adjusted as benchmark transects are completed. For practical purposes the difference between 30 and 40 percent utilization is difficult to monitor by wilderness rangers or packstock users in the backcountry. For an area determined to not be suitable for allocation to a commercial packstation, but that may be suitable for limited grazing, the same allowable utilization factors will apply, however, the carrying and actual use should be ephemeral and intermittent due to limiting factors such as very low productivity, high elevation, or small available area. The thought process for these types of areas is that a traveling group could periodically utilize some forage on an intermittent basis, but that repeated use would likely result in long term damage to the meadow or riparian resources. These areas should be used briefly, maintaining control of the stock at all times such as by holding the lead ropes while the stock are grazing.

The carrying capacities are an estimate, intended to allow initial allocation of use. They should be validated and adjusted by more intensive surveys and/or by monitoring of actual levels of stock use, vegetation utilization, and related impacts such as streambank alteration.

The initial estimate of carrying capacity is based on GIS mapping of meadows to determine gross acres, site estimates of the percent of the site that is suitable, site estimates of productivity based on the vegetative composition of the suitable area, and categorizing the site into a vegetation series as described by Ratliff (1985); multiplying the estimated productivity in pounds per acre by the applicable allowable use factor (Wilderness Plan, Appendix G, page 4); then dividing by the approximate nightly forage consumption of a horse or mule (Roberts, 1990). Productivity to determine an initial carrying capacity for a proposed use area was categorized as high, moderate, low or very low based on a visual estimate of the primary vegetative series represented and available to stock within the suitable area. For example: for this purpose the tall and vigorous sedge series were categorized as "high" productivity, approximately 2,405 per acre; the medium sedge series as "moderate" productivity, approximately 1,650 pounds per acre; short-hair grass sedge as low productivity, approximately 1,065 pounds per acre; the Slender spikerush, vacciium and similar series as very low productivity approximately 285 pounds per acre. The initial allowable utilization factor is based on the interdisciplinary team determination of site specific factors as documented in the meadow tables.

For sites with previous estimates of carrying capacity, the resulting estimated carrying capacity is usually less than previous estimates. Previous carrying capacity estimates did not account for the percentage of the area that is unsuitable (Roberts, 1990; Frolli, 1998), and in some cases the previous estimates were based on range analysis work from as far back as the 1950s, without accounting for known ecological changes and reduced productivity since that time (Frolli, 1998).

Use Trail Condition Inventory

This inventory was developed in 1999 by the Forest Soil Scientist and Hydrologist for the development of standards and guides in the Wilderness Plan. In 2001 and 2002, the protocol was refined and modified to reflect needs of this project. Implementation of this inventory is achieved through training by hydrologist and a consistent use of technical support staff throughout the duration of the inventories needed for this project. The inventory and condition assessment of all use trails identified by packstations is the goal for this project.

Campsite Condition Inventory

This inventory is developed following the Parsons/Stolghren method of campsite inventory (Parsons and Stohlgren, referenced in Cole 1989). Six characteristics of campsites are rated and a mean rating of 1-5 used to describe the level of impact. Other characteristics collected associated with the site include distance from water and firewood availability in and around the site. In all areas identified for use by packstations, this comprehensive inventory will be conducted. It will include all campsites, not just the sites identified by operators.

All other sensitive and MIS species:

No formalized surveys will be conducted. Observations of species will be recorded when relevant (such as doe deer with fawns, blue grouse with broods) during the IDT trips, and field surveys for the other species discussed above. These remaining species (deer, blue grouse, riparian songbirds) do not require site-specific survey but rather the assessment of habitat conditions in forests and grazed meadows, and along trails particularly in riparian habitats and how site conditions measure against standards and guidelines for riparian and wildlife habitats in the 1988 Inyo National Forest Land and Resource Management Plan.

Use Data

Pack Stations are required to report services provided on Forest land in the form of monthly Tally Sheets. Tally Sheet information will be used to verify destinations of services, type of services provided, stock numbers, client numbers, dates of service, and actual Service Days used. Wilderness Permit numbers are recorded on Tally Sheets to cross check the information in the Wilderness Permit System. Once the Tally Sheets are collected for all pack stations in a given year, they will be compiled and sorted to extract site specific information on numbers of operators in a given area, overlapping use, use trends, destinations, and party size.

Section 5 – Data Management

Analysis Units

The data will be integrated and catalogued by analysis unit. Analysis units are modified travel zones. The travel zones were designed 20+ years ago in creating the initial quotas through a systematic carrying capacity study in conjunction with the contiguous National Parks and FS units. These units will be modified for georeferencing that follows along divides and watersheds as well as minor modifications to the compartments for use patterns. These compartments will be used to integrate data, identify patterns and associations, and catalogue data comprehensively.

Photo documentation and annotated photo bibliography

Photo documentation is an important component in this analysis. Due to the capability of digital cameras, we are often finding ourselves with enormous files of photos, with overlap between specialists. However, it is in the interest of the project to continue this way in order to get the correct subjects, angles, and depictions in the photos and have choices in the end. In order to maintain records that make it easy to retrieve photos of areas and subjects a protocol will be used for this project that organizes the photos by analysis unit, subject and photographer. (Hall 2002)

Geographic Information System (GIS)

Geographic Information Systems (GIS) provide spatial references for much of the data and information collected and used in the wilderness planning efforts. GIS data is used to produce maps, conduct analyses, and facilitate the planning process. The data is organized into the following categories:

"Packer Request" Data – Information on commercial packstock use that has been provided to the Forest Service by packstation operators

"Inventory" Data – Information collected on specific wilderness inventories; e.g., campsites, meadows, etc

"Management Boundaries" – Boundaries used in the analysis, such as the wilderness boundary, forest boundary, and analysis unit boundaries

"Natural" Data – Spatial data on lakes, streams, vegetation, etc

"Background Images" – Digital formats of topographic maps, digital elevation models, and digital aerial photography

For a detailed description of the GIS files used in wilderness planning, please refer to Appendix E.

Section 6 – Analysis of Data

Need For Change Process

The Need For Change (NFC) Worksheet will be used to develop the proposed actions and alternative actions. These proposed actions and alternatives along with the described effects of the actions will be brought forward to Forest Service line officers. These line officers will make the determination as to whether the proposed actions will continue in the NEPA process.

The NFC concept was developed by Forest Service NEPA trainers as a method of accomplishing what is known as "left-side" planning. It is a methodical way of documenting relevant conditions and determining compliance with laws, regulations, and policies. The product of this process is to bring forward proposed actions for scoping. The NFC process used for this project also provides a place for assessing the cumulative effects of resources, individually and collectively. The process worksheet is Attachment E, and the protocol for the process is below.

Goals of Need for Change Process

- To summarize field data as an ID Team in a composite (Analysis area) approach.
- To initially assess effects of current conditions of packstock operation features (meadows, destinations, use trails etc), and compliance with existing (LRMP) direction, including desired condition and standards and guidelines.
- Generate needed actions to meet Forest Plan direction, alternatives of actions, and an ID team recommended proposed actions.
- Based on the extensive assessment of the ID team, identify further (more intensive) inventory or assessments, particularly biological inventories and cultural site inventories.
- View field condition data in comparison with 2002 packstation use, assess use levels, and conditions.

This study effectively concludes with the development of proposed actions used for scoping. At this point the acquired data can be used for describing current conditions, developing proposed actions, assessing the effects of actions, and assessing the cumulative effects of proposed actions and alternatives.

Table 3: 2001-2004 ID team Data Collection Schedule for CEA

Trip	Days	Date
2001 trips were conducted prior to CEA requirement, with the purpose of site specific analysis of McGee and Mammoth Lakes Pack Outfit pack outfits operating areas		
Hilton	3	October 2001
Convict	3	September 2001
Fish Creek (McGee, Silver Divide north)	15	July/August 2001
Pine Creek-French Canyon-Humphreys	11	August 2002
Shadow-Ediza-Garnet-1,000	8	July 2002
Little Lakes Valley	3	September 2002
Piute Pass	3	July 2002
Blackcap	8	Sepember 2002
Bishop Pass	2	September 2002
Holcomb-Ashley-Anona – Rosalie-Beck	6	September 2003
Mono Pass-Mono Creek	8	July 2003
Florence-PCT-Bear Lakes	10	July-August 2003
AA West – Post Peak Pass, Isberg, Fernandez	9	August 2003
Rush Creek	5	September 2003
Sabrina	4	Sept 2003
Shepherd	2	TBD
Sawmill	2	TBD

Trip	Days	Date
Taboose	2	TBD
Red Lake	1	TBD
Corral 77	5	TBD
Kearsarge	2	TBD
Cottonwood Lakes	4	TBD
Goodale/Silver Pass	5	TBD
Tamarack	2	TBD
NF Big Pine	3	TBD

Appendix A. Interdisciplinary Team

Botanist – Sue Weis

1998-Present	Botanist, Inyo National Forest, CA
1999	M.S. Degree, Biology, Cal Poly San Luis Obispo, CA
1997-1998	Botanist, USGS Mojave Mapping Project, CA
1996-1997	Botanist, Plumas National Forest, CA (seasonal)
1996	Botanist, Guadalupe Oil fields, CA, rare plant surveys
1995-2000	Botanist, Camp Roberts, Camp San Luis Obispo, Fort Hunter Liggett, CA Land Condition Trend Analysis (seasonal)
1994	Botanist, San Simeon State Park, CA Vegetation mapping and sampling
1986-1990	Postal Service, South Lake Tahoe, CA
1984-1986	Peace Corps Volunteer, Senegal, West Africa
1974-1983	Postal Service and other employment
1973	B.A. Degree, Psychology, Carleton College, Northfield, MN

Heritage/Tribal Relations – William Kerwin

2002-Present	Wilderness Archaeologist, Inyo National Forest
1999	B.A. Degree, Anthropology, California State University Humbolt
1997	A.A. Degree, Liberal Arts, Cabrillo Community College, Santa Cruz, California
1989-1997	Trail Crew Foreman, Richard May Construction, Mammoth Lakes California, Western United States
1989	Trailworker, Mt. Whitney Trail Crew, Inyo National Forest

Hydrologist – Erin Lutrick

2002 – Present	Hydrologist, Inyo National Forest, CA
2001	Master's Degree, Environmental Planning, U.C. Berkeley, CA
2000-2002	Research Assistant, Hydrology/Fluvial Geomorphology, for consultant G. Mathias Kondolf, PhD and U.C. Berkeley.
1998-1999	Soil Laboratory Technician, U.C. Santa Barbara
1998	B.S. Degree, Geology, U.C. Santa Barbara

Pack Station Special Uses Permit Administrator – Diana Pietrasanta

2002-Present	Special Use Permit Administrator, Mammoth Ranger District, Inyo National Forest, CA
1993-2002	Wilderness Manager, Mt. Whitney Ranger District, Inyo National Forest, CA
1990-1993	John Muir Wilderness Manager, Mt. Whitney Ranger District, Inyo National Forest, CA
1989-1990	Wilderness Ranger, Mt. Whitney Ranger District, Inyo National Forest, CA
1991	Minor, Forestry, Colorado State University, CO
1983-1989	Park Ranger, Resource Management, Glacier National Park, West Glacier, MT

1980-1983	Park Dispatcher/Backcountry Office, Glacier National Park, West Glacier, MT
1981	BS Degree, Botany, University of California, Davis CA
1979	Park Aid, Devil's Postpile National Monument, CA
1978	Recreation Technician, Mono Ranger District, Inyo National Forest, CA
1977	Firefighter, California Dept. of Forestry, State of California, Etiwanda CA

Range Conservationist – Del Hubbs

1996- Present	Rangeland Management Specialist, Inyo National Forest
1988- 1996	Range Conservationist, Inyo National Forest
1978- 1988	Forestry Technician, Fire Suppression, Inyo National Forest
1976-1977	Forestry Technician, Fire Suppression, Mendocino National Forest
1975- 1976	Range Technician, Klamath National Forest
1975	B.S. Degree, Renewable Natural Resources Management, U.C. Davis

Soil Scientist – Todd Ellsworth

2002-Present	Watershed Program Manager. Inyo National Forest
2001-2002	Forest Soil Scientist, Inyo National Forest
1995-2001	District Soil Scientist/Resource Officer, Groveland District, Stanislaus National Forest
1991-1995	Soil Scientist, Sierra National Forest
1989-1991	Soil Scientist, Jicarilla Agency Bureau of Indian Affairs, Dulce, New Mexico
1988-1989	Soils Technician, Coconino National Forest
1988	B.S. Soil and Water Science, University of Arizona, Tucson,AZ.

Trails Specialist - Marty Hornick

1997-Present	Forest Trail Program Coordinator, Inyo National Forest
1994-1997	Wilderness/Trails Team Leader (Acting), Inyo National Forest
1991-1994	Forest Trail Program Coordinator, Inyo National Forest
1988-1991	John Muir Wilderness Manager, Mt Whitney Ranger District
1987-1988	Mt Whitney Wilderness and Trail Manager, Mt Whitney Ranger District
1985, 1986	District Trail Construction Supervisor, Mt Whitney Ranger District
1984	Trail Contract Inspector, Inyo National Forest
1982, 1983	Recreation Technician, Compliance Officer, Firefighter, Trailworker
1980, 1981	Trailworker, White Mountain and Mt Whitney Ranger Districts

Wilderness Specialist – Mary Beth Hennessy

2002-Present	Wilderness Specialist, Inyo National Forest, CA
1997-2002	Wilderness/Trails Team Leader, Inyo National Forest, CA
1995-1997	District Recreation Officer, Pike /San Isabel National Forest, Leadville Colorado
1991-1995	Wilderness/Trails/Special Uses/Dispersed Recreation Planner, Pike/San Isabel National Forest, Leadville Colorado
1990-1991	College Instructor, Sierra Institute, University of California Extension, Santa Cruz CA

1991	M.S. Degree, Environmental Studies, University of Montana, Missoula, MT
1989	Wilderness Ranger, Inyo National Forest
1985-1989	Wilderness Information Coordinator, Park Ranger, Yosemite National Park, CA
1982-1985	Instructor, Yosemite Institute, Yosemite National Park, CA
1981	B.A. Degree History, University of California, Santa Barbara

Wildlife Biologist – Gary Milano

1994-Present	Wildlife Biologist, Inyo National Forest
1979-1994	Biological Technician (Wildlife) Bend Ranger District, Deschutes National Forest, OR
1977-1979	Wilderness Ranger, Beartooth and Washakie Wilderness Areas, Shoshone National Forest, WY
1976	Biological Technician (Wildlife), Lander Resource Area, Bureau of Land Management, Lander, WY
1975	Biological Technician (Wildlife), White River Resource Area, Bureau of Land Management, Meeker, CO
1974	B.S. Degree, Wildlife Management, University of New Hampshire

Appendix B. Literature Review

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Appendix C. Wildlife Species Considered and Analysis Levels

Assumptions:

1. Most species are dismissed from intensive analysis, or from the need to intensively survey the species or its habitat since packstation operations have not been observed to have any substantial impacts on the species (See species considered below).

2. Yosemite toad, willow flycatcher, great gray owl, spotted owl and goshawk surveys and habitat assessments may occur only where habitat has been delineated in or directly adjacent to pack station wilderness operations. Additional work may include complete habitat and observation maps and condition assessments across a species range within the analysis area but this level of information is not essential to EIS analysis.

Species considered: Threatened, Endangered, Proposed, Forest Service Sensitive, and Sierra and Inyo National Forest Land Management Plan Management Indicator Species (MIS) and/or their habitat that might be affected by the re-issuance of the packstock permits.

Species	Designation	Impact/Survey Category
Bald Eagle	Federal Threatened	*
Sierra Nevada bighorn sheep	Federal Endangered	*
Paiute cutthroat trout	Federal Threatened	**
Lahontan cutthroat trout	Federal Threatened	**
Mountain yellow-legged frog	Sensitive	***
Yosemite toad	Sensitive	***
Great gray owl	Sensitive/Inyo MIS	***
Northern goshawk	Sensitive/InyoMIS	***
Willow flycatcher	Sensitive/Inyo MIS	***
Pacific fisher	Sensitive/Inyo MIS	*
California wolverine	Sensitive/Inyo MIS	*
California spotted owl	Sensitive/Inyo MIS	*
Sierra Nevada red fox	Inyo MIS	*
Peregrine falcon	Sensitive	*
Townsend’s big-eared bat	Sensitive	*
Pallid bat	Sensitive	*
Wong’s springsnaill	Sensitive	*

Inyo mountain salamander	Sensitive	**
Kern Plateau salamander	Sensitive	**
Blue grouse	Inyo MIS	**
Golden eagle	Inyo MIS	*
Prairie falcon	Inyo MIS	*
Hairy woodpecker	Inyo MIS	**
Williamson woodpecker	Inyo MIS	**
Mule deer	Inyo MIS	**
Yellow warbler	Inyo MIS	**
Osprey	Sierra MIS	*
Sierra Bird guild	Sierra MIS	**
Resident trout species	Sierra MIS	**

- * Species where effects analysis is already satisfactorily described in the 2001 John Muir/Ansel Adams Wilderness Plan EIS and that are unlikely to be substantively affected by packstation operations and additional data collection is not necessary for permit renewal and cumulative effects analysis.

- ** Species where effects analysis is already satisfactorily described in EIS or additional analysis can be inferred/conducted using existing information such as riparian GIS coverages in combination with other resource surveys and analyses ie. hydrology, soils,range, trails.

- *** Species that require some level of intensive presence/absence survey efforts, and field habitat assessments for permit renewal and cumulative effects analysis EIS input. Protocol survey may be used for the northern goshawk, great gray owl and willow flycatcher.

Appendix D. Inyo and Sierra NF Sensitive Plant Species Occurring in John Muir and Ansel Adams Wildernesses

Sensitive plant species are assigned to guilds, as in the Wilderness Plan, in order to assess effects.

Common Name	Scientific Name	Guild
Bodie Hills rock cress	*Arabis bodiensis*	Rock outcrop/talus
Pinzl's rock cress	*Arabis pinzlae*	Rock outcrop/talus
Raven's milkvetch	*Astragalus ravenii*	Rock outcrop/talus
Scalloped moonwort	*Botrychium crenulatum*	Riparian/meadow
Slender moonwort	*Botrychium lineare*	Rockoutcrop/talus Riparian/meadow
Upright moonwort	*Botrychium ascendens*	Riparian/meadow
Mingan moonwort	*Botrychium minganense*	Riparian/meadow
Bolander's candle moss	*Bruchia bolanderi*	Riparian/meadow
Mono Hot Springs evening	*Camissonia sierrae* ssp. *alticola*	Rock outcrop/talus
Tioga Pass sedge	*Carex tiogana*	Riparian/meadow
Unexpected larkspur	*Delphinium inopinum*	Rock outcrop/talus
Tulare County bleeding heart	*Dicentra nevadensis*	Upland, non-rocky
Tahoe draba	*Draba asterophora* var.	Rock outcrop/talus
Mt. Whitney draba	*Draba sharsmithii*	Rock outcrop/talus
Subalpine fireweed	*Epilobium howellii*	Riparian/meadow
Hall's Daisy	*Erigeron aequifolius*	Rock outcrop/talus
Kettle Dome buckwheat	*Eriogonum prattenianum* var.	Rock outcrop/talus
Monarch goldenaster	*Heterotheca monarchensis*	Rock outcrop/talus
Short-leaved hulsea	*Hulsea brevifolia*	Upland, non-rocky
Veined water lichen	*Hydrothyria venosa*	Riparian/meadow
Congdon's lewisii	*Lewisia congdonii*	Rock outcrop/talus
Yosemite lewisii	*Lewisia disepala*	Rock outcrop/talus
Father Crowley's lupine	*Lupinus padre-crowleyi*	Upland, non-rocky
Moss	*Meesia triquetra*	Riparian/meadow
Moss	*Meesia uliginosa*	Riparian/meadow
Sweet-smelling monardella	*Monardella beneolens*	Rock outcrop/talus
Inyo beardtongue	*Penstemon papillatus*	Upland, non-rocky
Muir's raillardella	*Raillardiopsis muirii*	Rock outcrop/talus Upland, non-rocky
Tehipite Valley jewel-flower	*Streptanthus fenestratus*	Upland, non-rocky
Bolander's clover	*Trifolium bolanderi*	Riparian/meadow
Grey-leaved violet	*Viola pinetorum* ssp. *grisea*	Upland, non-rocky

(source: Wilderness Plan, Biological Evaluation)

Appendix E. Protocols

Extensive Assessment

Meadow Inventory

Criteria for meadow ratings, for Pack Station IDT – This version created on 12/5/03

General Meadow Characteristics

ID # - (Meadow ID): Use the 3 letter analysis unit code, then number starting at one as the meadows are visited.

Area (acres):

Area was calculated using ArcView GIS. They were delineated by looking at aerial photographs and identifying meadows using vegetative cover. We drew each meadow perimeter in ArcView on 1998 ortho photo quads, matching features on the air photos with those on air photos visually, with the view scale at 1:5,000.

Elevation:
Elevations are listed in the meadow characteristic table as the actual elevation of the approximate center of the meadow, given in feet and rounded to the nearest 100 feet. If we want to group elevations, we will use the designations low, moderate and high elevation based on Ratliff et al (1985).

1 = low = 5,000-7,000 ft
2 = moderate = 7,000-9,000 ft
3 = high = > 9,000 ft

Slope:
Ratliff (1985) wrote that meadows with slopes under two percent are likely to be stable, while meadows with slopes over two percent are likely to be unstable. The 2001 Wilderness Plan EIS reported that meadows over 30% slope are not capable of supporting stock grazing.
Slope to be measured is the maximum slope in an area to which we are applying management (ie. Any major portion of the meadow where grazing would likely occur)

1: 0-2% slope= low gradient
2: 3-9% = moderate
3: 10-30% = high gradient meadow
4: > 30% = extreme slope, automatically unsuitable (Incapable, defined in Wilderness Plan EIS)

Management (current)
Current management on the meadow, for example: “open”, “closed”, “closed for 3 years”.
2001 Reported Use
Number of stock nights at each meadow reported by packstations for summer 2001. This number does not always accurately represent the number of nights that stock actually grazed in the

meadow, because sometimes they were held near the meadow but did not graze. However, we cannot get more accurate information at this point.

2002 Reported Use

Number of stock nights at each meadow reported by packstations for summer 2002. This number does not always accurately represent the number of nights that stock actually grazed in the meadow, because sometimes they were held near the meadow but did not graze. However, we cannot get more accurate information at this point.

2003 Reported Use
Number of stock nights at each meadow reported by packstations for summer 2003.

Wildlife

Sierra Nevada Forest Plan Amendment Focus Species/Sensitive Species Rating

Yosemite toad (Yoto)
0 = No suitable breeding habitat
1 = Suitable unoccupied breeding habitat based on single visit to site.
2 = Occupied suitable breeding habitat

Willow flycatcher (Wifl)
0 = No suitable breeding habitat
1 = Suitable unoccupied breeding habitat based on single visit to site.
2 = Occupied suitable breeding habitat

Great gray owl (GGO)
0 = no habitat
1 = suitable great gray owl meadow foraging habitat adjacent to suitable nesting habitat

Overall Riparian Wildlife Habitat Rating:

The overall rating considers changes in riparian wildlife habitat related to meadow morphology and vegetation away from late seral moist meadow, wet meadow, and wetland habitat including special habitats such as springs, seeps, vernal pools, fens, bogs, and marshes. Effects categories reflect progressive movement away from consistency with management goals and direction, desired future condition statements, and standards and guidelines for riparian management areas as defined in the Sierra Nevada Forest Plan Amendment Record of Decision (ROD) including the Aquatic Management Strategy (AMS) and Riparian Conservation Area (RCA) Objectives (RCO's).

0 = Meadow identified for assessment. No evidence of existing or historical uses to evaluate effects on wildlife habitat.

Late seral meadow condition providing high quality wildlife habitat.

1 = No adverse effects observed to wildlife habitat from existing/historical use. Late seral meadow condition provides high quality riparian wildlife habitat consistent with desired

conditions identified in the AMS and RCO's. Plant composition can be a category 2 if localized. No other category 2 or 3 impacts noted in meadow table related to grazing or trails such as headcuts, stream incision, sod fragmentation, hummocking, compaction, vegetation composition changes, or adverse effects to springs, seeps, vernal pools, bogs, fens or marshes.
2 = Existing/historical use shows impacts on meadow morphology and vegetation that are affecting riparian wildlife habitat but are for the most part within management thresholds identified in the AMS, and RCO's. Meadow table ratings for impacts noted in #1 are for the most part in category 1 and 2 and where habitat changes are minor and/or localized. There can be very localized 3 assessment ratings such as where a trail crosses a spring that results in an inconsistency with the AMS and ROC's and some resource degradation but the majority of the meadow is in good condition and not threatened by the observed impacts. Late seral moist and wet meadow, and wetland modified but not to the point where it is significantly affecting riparian wildlife habitat availability or condition.
3 = Existing/historical use shows impacts on meadow morphology and vegetation that are affecting riparian wildlife habitat desired condition over greater areas of a meadow or critical areas such as Yosemite toad breeding areas and are exceeding management thresholds identified in the AMS, and RCO's with possible downward trend indicators. Meadow table ratings for impacts noted in #1 have a number of category 2 and some 3 conditions where habitat changes are more widespread and severe. Late seral moist and wet meadow, and wetland modified to the point where uses are adversely affecting riparian wildlife habitat availability or condition. Headcuts and/or stream incision are posing threats to riparian wildlife habitat availability and condition.from water table reduction.

Additional Survey Needed? Yes or No
Survey Type: Species needed to be surveyed – plant or animal

Trails

Trail extent in meadow
0: No trails in meadow
1: Trail on meadow periphery
2: One trail through meadow
3: more than one trail through meadow

Trail level through meadow (user or system trail)
0: No trails in meadow
1: Sod unbroken over at least 90% of the trail.
2: Sod broken over more than 10% of the trail, and trail up to 12” wide.
3: Sod broken over all the trail, and trail up to 24” wide, over 12” wide for at least 50% of the trail. Major trail. Equivalent to a level 2 system trail.
4: Major trail, over 24” wide, equivalent to a level 3 system trail or above.

Trail Problems
Trail widening severity (Same as on user trail and system trail assessment)
0: None
1: Slight (Less than 2x appropriate width)
2: Moderate (2-3 times appropriate width)
3: Severe (>3X appropriate width)

Trail widening extent
0: No widening observed on trail
1: widening on up to 5% of the trail within the meadow
2: widening on up to 25% of the trail within the meadow
3: widening on over 25% of the length of the trail within the meadow

Multiple trailing severity
0: No multiple trailing within meadow
1: Slight multi-trailing, neither trail incised
2: Moderate multi-trailing, two to three trails formed with some incision
3: Severe multi trailing, over 3 trails formed with some incision

Multiple trailing extent
0: No multiple trailing observed within meadow
1: multiple trailing on up to 5% of the trail within the meadow
2: multiple trailing on up to 25% of the trail within the meadow
3: multiple trailing on over 25% of the length of the trail within the meadow

Trail headcut severity
0: No headcuts observed on trail
1: Slight headcut observed on trail, less than rooting depth
2: Moderate headcut observed on trail, as deep as rooting depth
3: Severe headcut observed on trail, below rooting depth

Trail headcut extent
0: No headcuts observed on trail
1: Headcuts on up to 5% of the trail within the meadow
2: Headcuts on up to 25% of the trail within the meadow
3: Headcuts on over 25% of the length of the trail within the meadow

Trail incision severity
0: No trail incision observed within meadow
1: Slight incision, above rooting depth
2: Moderate incision, up to rooting depth
3: Severe incision, deeper than rooting depth

Trail incision extent
0: No incision observed on trail
1: Incision on up to 5% of the trail within the meadow
2: Incision on up to 25% of the trail within the meadow
3: Incision on over 25% of the length of the trail within the meadow

Vegetation

Fen present
0 – No fen indicators present.
1 – Sphagnum present in patches, not extensive, other fen characters not present.
2 – Fen. Indicator plant species are present or deep fibric soil (>40 cm thick)

TEPS Plants

0 – No habitat for special status plants.
1 – Potential habitat for special status plants, none known.

These meadows have not been completely surveyed, but habitat for at least one special status plant is present. The following plants occur in meadow habitats in the wilderness areas.

- Epilobium howellii – Edge of meadows at elevations 6500-8900 ft;
- Botrychium crenulatum, B. ascendens, B. lineare or any Botrychium species other than B. simplex – non-granitic soils or granitic soils mixed with some other type of soil (volcanic, carbonate);
- Bruchia bolanderi – moss on damp clay soil on vertical stream banks;
- Carex tiogana – Wet areas along lake margins at elevation 10200-10900 ft;
- Hydrotheria venosa – Water lichen in streams at elevation 5000-7000 ft;
- Meesia triquetra, M. uliginosa – Mosses in acidic soils, usually with Sphagnum, at elevation 6100-8100 ft;
- Trifolium bolanderi – West side at elevation 6800-7300 ft.

2 – Special status plants present

Weeds
1. No weeds (non-native plants) present
2. Weeds present

Weed Species
PLANTS code for non-native plant species found

Vegetation Productivity
1: High – 2,405 – 2,805 pounds per acre
2: Moderate – 1,145 – 1,650 pounds per acre
3: Low – 285 – 1,065 pounds per acre
4. Very low – < 285 pounds per acre

Resiliency
Range site resiliency is determined by the interdisciplinary team considering limiting factors such as elevation, availability of moisture during the growing season, plant species present, soil development, slope, and soil erodibility. Risk factors such as vulnerability to increased erosion and soil loss during reasonably foreseeable events, such as summer thunderstorms and spring runoff are a limiting factor.
1. Moderate or no limiting factors.
2. Several to many limiting factors present, none severe.
3. Many, or least one severe, limiting factors present.

Vegetation Impacts

TEPS Plant Impacts
0: No conflict with present use
1: Present use causing slight damage to plants or habitat

2: Moderate damage
3: Severe damage

Plant Composition Change
An on-site determination by the interdisciplinary team comparing the observed or measured similarity of the presence and abundance of plant species to the potential natural plant community, usually the high seral condition, for that site.
1: None or Few changes away from the potential natural plant community.
2: Some isolated, or patchy changes away from the potential natural plant community, over less than one-third of the area.
3: Well-defined changes away from the potential natural plant community, over more than one third of the area.

Soil/Wetness
Percent Vegetation Moisture Category
Enter percentage of total meadow with the following vegetative moisture category
Dry: (0-100%)
Moist: (0-100%)
Wet: (0-100%)
Wetland: (0-100)

Proportion of Meadow never Range Ready
We write down the actual estimated percentage of non-range ready area of the meadow, but if we need to categorize it, we can use the categories below:
The Percentage range ready usually corresponds with the percent of the meadow that is wetland, plus a portion of the wet areas. The portion of the wet areas included depends on vegetative type and other factors.
0: The entire meadow reaches range readiness (>95% of area)
1: 5-25% of the meadow never reaches range readiness
2: 26-75% of the meadow never reaches range readiness
3: >75% of the meadow never reaches range readiness

Wet Areas Avoidable?
1: Stock could get to the range ready areas without causing impacts to wet areas, with no management
2: Stock could avoid wet areas with management
3: Stock could not get to the range ready areas without crossing wet areas, even with active management

"A" Horizon Thickness

Measure the "A" horizon and report the number (in inches)
If the depth is greater than 6 inches, report it as ">6 in."

Soil Erosion Hazard Rating (EHR) (form for R-5 Interagency Erosion Hazard Rating: R5-2500-14 [2190])
1: Low
2: Moderate
3: High

4: Very High

Soil
(Away from springheads, spring channels and seeps)

Sod Fragmentation Severity (independent of extent)
0: No sod fragmentation observed
1: Low severity sod fragmentation observed, due to hoof punching or other disturbance.
2: Moderate severity sod fragmentation observed, due to hoof punching. Sod removed and soil broken up to rooting depth.
3: Severe sod fragmentation. Soil broken to below rooting depth.

Sod Fragmentation Extent (independent of severity)
0: No sod fragmentation observed, or trace amounts of fragmentation
1: Fragmentation up to 5% of the sod surface
2: Fragmentation from 6-15% of the sod surface
3: Fragmentation of over 15% of the sod surface

Soil compaction
Information for this criteria is derived from the Watershed Characteristics Rating part of Amendment 6, Interpreting Indicators of Rangeland Health (2000) Technical Reference 1734-6 and R-5 Soil Quality Standards (SNFPA 2001 App. F). Compacted layers in rangelands are usually less than 6 in below the soil surface. Compaction is determined by using a tile shade and "feeling" the compacted layer, digging a shallow pit (less than 1 foot) observing mashed/horizontal roots, and a soil structure change (ie. Platy) and/or dense soil over less dense soil. Suppressed vegetative growth (compared to known uncompacted sites) can also be used inconjuction with the previously mentioned indicators. Physical observation is important due to the dense root mass generally present in a meadow situation.

Compaction Severity
0: No compaction
1: Slight Compaction: Weakly restrictive to water movement, root penetration and plant vigor, no evidence of platiness.
2: Moderate Compaction: Moderately restricts water movement, and root penetration. May be limited evidence of platy structure and mashed roots, "J" curve roots at the compacted layer may be present. Plant vigor appears to be affected. Compaction is not alleviated over the winter rest period.
3: Severe Compaction: Greatly restricts water movement, root penetration. Evidence of platy structure and mashed roots. A "J" curve root at the compacted layer is common. May be evidence of water runoff. Plant vigor and cover is affected.

Compaction Extent
0: No compaction evident
1: Rarely present, less than 5% of meadow area
2: Moderate extent, from 5-15% of meadow area
3: Widespread. Greater than 15% of the meadow area

Bare Soil Extent
0: No bare soil observed

1: Rarely present, less than 5% of meadow area
2: Moderate extent, from 6-15% of meadow area
3: Widespread. Greater than 15% of the meadow area

Hummock severity (from Amendment 6)
0: No unnatural hummocking observed
1: Slight evidence of static hummocks with distinct relief and trailing pathways. Hummocks are still mostly vegetated with similar species on top and between hummocks.
2: Topographic relief distinct. Roots may be exposed on edges of hummocks or hoofmarks present. Vegetation composition may be different on top and between hummocks.
3: Static hummocks are evident with distinct topographical relief. Roots are exposed on edges of hummocks and/or hoofmarks present. Vegetation composition is distinctly different on top of the hummocks and between the hummocks.

Hummock extent:
0: No unnatural hummocking observed
1: Hummocks in some wet or spring areas, less than 5% of meadow
2: Hummocks observed over 6-15% of meadow.
3: Hummocks observed on over 15% of meadow.

Hydrology

Stream Presence
0: No stream in meadow
1: Stream on meadow perimeter
2: One or more streams through meadow

Streambank Erodibility (adapted from SCI handbook)
This is based on current condition, not on potential condition without disturbance
1: Low erosion potential – armored with rocks or very high vegetative cover (over 90% of bank armored) to prevent erosion
2: Moderate erosion potential – some rocks, boulders, or vegetative cover (75-90% cover)
3: High erosion potential – No rocks, boulders, vegetative cover or other armoring to prevent streambank erosion (cover less than 75% of bank length)

Spring channels, springheads and seeps
Note: Spring channels are defined as channels with their source a spring within or on the perimeter of the meadow.
0: No spring channels observed in or on the perimeter of the meadow
1: More than one spring channel concentrated in one area of the meadow, an incidental water source for meadow.
2: More than one spring channel observed in the meadow, and in two or more distinct areas (eg – on opposite sites of the meadow, or spread out over an area over ¼ the length of the meadow). A significant water source for the meadow, but not the only source.
3: Spring or springs are providing all or most of the water source of this meadow

Seeps, Spring heads and spring channels avoidability
0: Spring channels are not accessible to stock (eg they're across a stream where stock doesn't go)
1: Stock could avoid spring channels, seeps, springs head areas with management

2: Stock could not get to the range ready areas without crossing wet areas, even with active management

Lake or pond presence
0: No lake adjacent to meadow
1: Lake adjacent to meadow

Lakeshore erodibility
1: Low erosion potential – armored with rocks or very high vegetative cover to prevent erosion
2: Moderate erosion potential – some rocks, boulders, or vegetative cover
3: High erosion potential – No rocks, boulders, vegetative cover or other armoring to prevent lakeshore erosion

Drinking Water Accessibility
0: Drinking water accessible without passing through wet (non range-ready) areas with no management of stock
1: Drinking water accessible to stock without passing through wet areas with management
2: Drinking water NOT accessible without passing through wet (non range-ready) areas, even with management

Lakeshore Impacts
0: No impacts observed
1: Slight impacts observed.
2: Moderate impacts observed.
3: Severe impacts observed.

Hydrology Related Impacts
Enter N/A for the following stream-related items if there is no stream within or adjacent to the meadow

Stream-associated headcut extent
0: No headcuts observed
1: One headcut observed or more than one headcut, but concentrated in a local headcut complex.
2: More than one headcut observed in two or more distinct areas (ie – 3 distinct headcuts on the same stream, but one headcut 100 feet downstream from the other)
3: Many headcuts observed on the stream in the meadow (ie – headcuts observed on most stream reaches in the meadow, creating a series of continuous headcuts)

Stream-associated headcut severity
0: No headcuts observed
1: Small headcut(s) observed. Height less than rooting depth. Not actively migrating or causing erosion away from the headcut.
2: Moderate-sized headcut(s) observed (Up to rooting depth of sod). May be leading to incision upstream, downstream, or laterally away from the stream.
3: Large headcut(s) observed. Headcuts deeper than rooting depth of sod. May be leading to incision upstream, downstream, or laterally away from the stream.

Stream-associated headcut location
0: No headcuts observed

1: Upper 1/3 of meadow
2: Middle 1/3 of meadow (could also include upper 1/3)
3: Lower 1/3 of meadow (could also include upper 2/3)

Stream incision severity (to be considered incision and not a headcut, the incision must continue more than 20 ft downstream from a headcut)
0: Streambanks are stable and show no evidence of incision beyond that naturally expected. The stream can access its floodplain.
1: Slight incision, less than rooting depth of sod,
2: Moderate incision, up to rooting depth of sod
3: Severe incision, deeper than rooting depth of sod

Stream incision extent
0: No stream incision observed or trace amounts of incision (<0.5%)
1: Up to 5% of the channel within or adjacent to the meadow incised
2: Up to 20% of the channel within or adjacent to the meadow incised
3: Over 20% of the channel within or adjacent to the meadow incised

Stream incision location
0: No incision observed
1: Upper 1/3 of meadow
2: Middle 1/3 of meadow (could also include upper 1/3)
3: Lower 1/3 of meadow (could also include upper 2/3)

Streambank Disturbance Severity (independent of extent)
0: Streambanks are stable and show no evidence of calving or sloughing.
1: Streambanks have slight disturbance, with slight broken sod or chiseling, no evidence of active erosion.
2: Streambanks have moderate disturbance, with banks partially bare of sod. Evidence of slight active erosion
3: Streambanks are bare of sod and are actively eroding

Streambank Disturbance Extent within meadow (independent of severity)
0: No streambank disturbance or trace amounts of disturbance
1: Up to 5% of streambank disturbed
2: Up to 20% of streambank disturbed
3: Over 20% of streambank disturbed

Proper Functioning Condition
0 – Proper Functioning Condition
1 – functional at risk, upward trend
2 – functional at risk, no trend apparent
3 – functional at risk, downward trend
4 – non functional
NA - no PFC designation made for the meadow.

Spring channels, seeps and springhead impacts
(enter NA for the following if no spring channels, seeps or springheads are observed)
Spring channel, seep and springhead trampling severity

0: No trampling observed
1: Slight indentations observed. Sod remains intact.
2: Moderate trampling observed. Sod is broken, but not beyond rooting depth.
3: Severe trampling observed. Sod broken to below rooting depth

Spring channel, seep and springhead trampling extent
0: No trampling observed
1: Up to 5% of the total area of spring channels, seeps and springheads are observed trampled
2: Up to 20% of the total area of spring channels, seeps and springheads are observed trampled
3: Over 20% of the total area of spring channels, seeps and springheads are observed trampled

Spring channel headcut severity
0: No headcuts observed in spring channels
1: Small headcut(s) observed in spring channels, less than rooting depth of sod
2: Moderate-sized headcut(s) observed in spring channels, up to rooting depth of sod
3: Deep headcut(s) observed in spring channels, deeper than rooting depth of sod

Spring channel headcut extent
0: No headcuts
1: Up to 5% of the total spring channel length observed to have headcuts
2: Up to 20% of the total spring channel length observed to have headcuts
3: Over 20% of the total spring channel length observed to have headcuts

Springhead/channel impacts from trails severity
0: none
1: slight
2: moderate
3: severe

Springhead/channel impacts from trails extent
0: No impacts
1: Up to 5% of the total spring area or channel length observed to have trail impacts
2: Up to 20% of the total spring area or channel length observed to have trail impacts
3: Over 20% of the total spring area or channel length observed to have trail impacts

Meadow Hydrologic Function

Meadow Hydrologic Function Alteration Severity
0: No evidence of hydrologic function alteration
1: Evidence of slight alteration of hydrologic function, including lowered water table, diversion of surface flow
2: Evidence of moderate alteration of hydrologic function
3: Evidence of severe alteration of hydrologic function

Meadow Hydrologic Function Alteration Extent
0: No evidence of hydrologic function alteration
1: Less than 5% of the meadow affected.
2: 5-20% of the meadow affected
3: Alteration of hydrologic function of over 20% of the meadow.

Meadow Hydrologic Function Alteration Cause
Enter as many as are applicable
0: No evidence of hydrologic function alteration
SI: Stream incision
SH: Stream headcuts
SB: Streambank disturbance
SpT: Spring/seep trampling
SpH: Spring channel headcuts
Sod: Sod fragmentation
Comp: Compaction
Tr: Trail impacts
Veg: Vegetation removal
Other: write-in

Management IDT Conditions

Suitability
This is the suitability of the meadow as determined by the IDT after field investigation. The suitability was determined using the suitability criteria checklist, which includes:

Elevation, site productivity, soil erodibility, gradient, distance from water, range readiness, historical impacts, existing vegetative condition, resiliency, access issues, appropriateness of improvements, campsite proximity, and proper functioning condition analysis.

1 – Suitable – suitable for commercial grazing allocation over a large portion of the meadow
2 – Partial – suitable for commercial grazing allocation over some of the meadow, with major areas unsuitable for any entry by stock.
3– Snacking – not suitable for commercial grazing allocation, but may be suitable for incidental grazing. Entry by stock may not be acceptable.
4- Unsuitable – not suitable for commercial grazing allocation or any entry by stock

Suitable portion of meadow (%)
The area of the meadow that the IDT estimated was suitable for grazing. Although we identified each entire meadow as "suitable", "partially suitable", "snacking" or "unsuitable", most of those meadows have at least some portion that the IDT determined was unsuitable for stock entry and/or grazing.

Estimated capacity (stock nights)
The estimated capacity is determined by multiplying estimated production, in pounds per acre, by suitable acres. The result is multiplied by the allowable use factor, either .3 or .4 as determined by the interdisciplinary team following guidelines in the Packstock Management Guide appendix to the EIS (Appendix H). The result is then divided by 36 (the approximate daily forage consumption in pounds of a mature, working, horse or mule) to arrive at an estimated number of stock days potentially available for allocation. Unsuitable areas within the larger wetland complex included: areas that remain too wet to be entered by stock throughout the summer; convex springs or seeps; large inclusions of low productivity vegetation; large areas of sphagnum and other mosses; and unstable or actively eroding areas.

Comments
Summarizes findings, especially justification for suitability determination.\

Overall resource vulnerability (done in office)
Overall resource vulnerability was determined using the meadow table results for meadow characteristics. It rates the total vulnerability by using slope, percent never range ready (categorized), wet area avoidability, wildlife habitat (rated 0-2), fen presence, vegetation TES habitat, vegetation productivity, EHR, A horizon thickness (categorized), stream erodibility, spring avoidability, lakeshore erodibility (12 categories)
Note: for those categories that only have a rating from 0 to 2, 2 is considered "severe"
1 – no characteristic vulnerability rated above "low" (1)
2 – 6 or fewer "moderate" (2) characteristic vulnerability rating, and the rest "low"
3 – more than 6 "moderate" (2) characteristic vulnerability rating, but none over a "moderate" rating
4 – 6"severe" (3) characteristic vulnerability rating
5 – more than 6 "severe" (3) characteristic vulnerability rating

Overall Resource Rating (done in office)
Overall resource rating is a rating using all meadow condition columns, and indicates the overall alteration that the meadow has experienced. The categories used are: wildlife impacts, trail widening severity, extent, multi-trail severity, extent, trail headcut severity, extent, trail incision severity, extent, veg. Impact, plant composition change, sod fragmentation severity, extent, soil compaction severity, extent, bare soil, hummock severity, hummock extent, lakeshore impact, stream headcut severity, extent, location, stream incision severity, extent, location, stream bank disturbance severity, extent, PFC, spring trampling severity, extent, spring channel headcut severity, extent, spring trail impact severity, extent, RCO, meadow hydrologic function severity, extent. (37 categories)
1 – no condition rated above "low" (1)
2 – 10 "moderate" (2) condition rating, and rest "low"
3 – more than 10 "moderate" (2) condition rating, but none over a "moderate" rating
4 – 10 or fewer "severe" (3-4) condition rating
5 – more than 10 "severe" (3-4) condition rating

References
Ratliff, R. D. 1985. Meadows in the Sierra Nevada of California: state of knowledge. United States Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. General Technical Report PSW-84.
Ratliff R.D. 1987. Managing Livestock Grazing on Meadows of California's Sierra Nevada: A Manager-User Guide. Cooperative Extension University of California. Division of Agriculture and National Resources. Leaflet 21421.
Crane, B.K. undated. Condition and Grazing Capacity of Wet Meadows on the East Slope of the Sierra Nevada Mountains.

Protocol for stock associated campsites

Protocol for determining compliance of stock-associated campsites in the Wilderness with Forest Service Best Management Practices

Note: Best Management Practice (BMP) evaluation was completed as described here during 2002 and later, but was not completed on many sites in 2001.

Locations chosen for BMPEP Analysis
As part of the Wilderness pack station EA, the IDT hydrologist and/or soil scientist determines stock-associated campsite compliance with Forest Service Best Management Practices (BMPs), using the Best Management Practices Evaluation Program (BMPEP) protocols. At each destination, at least one stock holding or spot and dunnage is evaluated. The site is chosen to be one that is representative of most sites at the destination. If the IDT finds a site with specific water quality concerns, the hydrologist usually fills out a BMPEP form to document the site.

Methods for BMPEP Evaluation

The BMPEP was created to track the implementation of BMPs and their effectiveness for protecting water quality. The program consists of filling out a form to document whether BMPs were implemented at the site, and whether activities at the site are affecting water quality. The form used for stock facilities in wilderness is BMPEP form R23 (see page 3), and the BMP guiding stock facilities is BMP 4-10 (USDA Forest Service, 2000). BMP 4-10 is as follows:

Location of Pack and Riding Stock Facilities and Use Areas in Wilderness, Primitive, and Wilderness Study Areas (Practice: 4-10)
Objective: To avoid degradation of water quality from pack, riding stock facilities and heavy use areas.

Explanation: This practice directs the location of pack and riding stock facilities to locations away from springs, stream, lakes, wet meadows, and other surface waters where pollution is likely to occur. This includes large campsites and trails used repeatedly by customers of commercial stock operators and other recreational uses.

Implementation: Forest Supervisors may authorize the construction and installation of simple temporary facilities when approved in the wilderness implementation plan, including corrals in connection with pack stock operation. Forest Supervisors may authorize the locations and use of large campsites for pack stock users and recreational users. If approved, they will not be located immediately adjacent to streams, or lakes, and should generally be in place for no more than one season of use.

The wilderness patrol will check the temporary livestock facilities authorized by the Forest Supervisor for compliance with the terms of the authorization.

The implementation analysis of the R23 BMPEP form analyzes whether the Wilderness Plan and/or the Special Use Permit include water quality protective measures for livestock facilities. In the Ansel Adams and John Muir Wilderness, the requirements are included in the Wilderness Management Plan (USDA Forest Service, 2001b), listed below:

"Campsites will be located 100 feet from water. In areas where terrain does not permit a campsite to be 100 feet from water, sites will be no closer than 50 feet from water." (pg. 16)
The Wilderness Plan management direction is to apply BMPs to protect water quality, and therefore encompasses BMP 4.10 described above.

Implementation of BMPs is complete if campsites are over 100 feet from water or 50 feet if terrain does not permit the campsite to be 100 feet away. The measures are effective if water quality is not degraded by sediment or other pollutants entering surface water at the campsite.

The following Protocol and BMPEP Form are taken from the BMPEP User's Guide, and are the protocols used to evaluate stock-related campsites in the Wilderness:

BMPEP On-Site Evaluation

Location of Stock Facilities in Wilderness (R23)
(Reference BMP 4.10)

Header Information Unique To This Form
Wilderness Area: Provide the name.
Type Of Facility: Indicate if the facility evaluated is a corral, holding area, water/feeding area, hitchline, group camp or other high use area.
Facility Operated By: If the Forest Service operates facility, write FS, if operated by concessionaire or Special Use Permitted, provide the name of the operator.
Operating Season: Indicate the normal operating season of the facility (e.g. June 1 - Sept 30).
Developing The Sample Pool And Selecting The Evaluation Sites
Develop a pool that includes all stock facilities (corrals, holding, watering feeding areas, etc.) located within or serving wilderness.
Timing Of The Evaluation
Evaluation of implementation must be completed at the end of the grazing season and prior to (or coincident with) the effectiveness determinations. Effectiveness measurements should therefore also be conducted at the end of the grazing season. (For the purpose of this Wilderness Packstation EA, timing is irrelevant)
Conducting the Implementation Rating
Implementation is rated for two factors, and involves a combination of field survey and review of the applicable Forest Service Manual and Handbooks, Wilderness Implementation Plan and applicable Special Use Permits.
Conduct a paper review to determine:
If the facility is designed and operated as per direction in the Wilderness Implementation Plan or Special Use Permit.
Conduct a Field Review to Determine:
That the facility is located greater than one hundred feet from the nearest lake or stream channel.
Conducting the Effectiveness Evaluation
Locating The Sample Site
Evaluation of Effectiveness is based on a survey of the land downslope of the stock facility. The observer should walk a transect along the perimeter of the facility through which water runoff would have to flow to reach nearby channels or lakes.
Sampling Protocols

Along this transect, the observer should look for evidence of sediment being transported to channels or lakes. Transport would most likely by rills or gullies that originate or pass through the stock facility, and if any rills or gullies are found, they should be followed downslope to see if they reach channels or lakes. Less likely, but possible is the transport of sediment by sheet erosion. If sheet erosion is occurring, then there should be evidence of recent sediment deposition behind obstructions or in depressions. When sediment is found, the deposition should be tracked downslope to see if there is indication of delivery of sediment to channels or lakes.
Along the transect, also look for evidence that any other contaminants, such as feed or animal waste, have been transported to watercourses or lakes.

References

USDA Forest Service. 2000. Water quality management for National Forest System lands in California: Best Management Practices. Pacific Southwest Region, Vallejo, California.
USDA Forest Service. 2001a. Investigating Water Quality in the Pacific Southwest Region – Best Management Practices Evaluation Program: A User's Guide. Pacific Southwest Region, Vallejo, California.
USDA Forest Service. 2001b. Wilderness Management Plan for the Ansel Adams, John Muir and Dinkey Lakes Wildernesses: Inyo and Sierra National Forests. Pacific Southwest Region, Vallejo, CA.

Best Management Practices Evaluation

UTM Coordinates **Zone** __ __
Easting __ __ __ __ __ __
Northing __ __ __ __ __ __ __

Form R23: Location of Stock Facilities in Wilderness

(BMP 4.11)

ID#: _____

Selection Code: _____

Forest _____ District _____ Watershed _____ Names and titles of reviewers:

Wilderness Area _____ Type of Facility _____ _____

Operated by _____ Operating Season _____ _____

T _____ R _____ S _____ NFS Watershed # _____ _____

Date of Review _____

Report Prepared By: _____

IMPLEMENTATION

1 = Exceeds contract/project requirements
2 = Meets contract/project requirements
3 = Minor departure from contract/project requirements
4 = Major departure from contract/project requirements
Rate as NA if criteria not applicable at this site

	Rating
1) Wilderness Plan and/or Special Use Permit have water quality protective measures for livestock facilities .	_____
2) Are water quality protective measures implemented on the ground?	_____

If any rating is "3" or "4", complete the following:

Problem occurred in which phase(s) of the project: ☐ Site Evaluation ☐ Plan Prescription ☐ EA ☐ Permit/Operating Plan ☐ Administration

Describe deficiencies corrective actions:

EFFECTIVENESS

	Yes	No
1) Is there any evidence of sediment or other substances that might degrade water quality (animal waste, fertilizers, feeds, etc.) reaching the nearest lake or stream channel as a result of the stock facility?	_____	_____

Comment on causes and corrective actions if response is "yes":

Continued on reverse? ☐

Proper Functioning Condition (PFC) Protocol For Lotic and Lentic Evaluations

Introduction
The Wilderness Interdisciplinary Team completed Proper Functioning Condition (PFC) assessments on most of the meadows and other grazing areas that we evaluated for grazing suitability. On each PFC form that we filled out, we roughly identified the extent of the meadow area or stream reach we evaluated. We sometimes completed PFC assessments on a stream throughout a meadow, but usually assessed a smaller reach within the meadow. We completed PFC assessments as part of the analysis of grazing areas, using it to help determine actions to be taken in the requested grazing area, as required by Riparian Conservation Objective 5, Standard #117 in the Record of Decision for the Sierra Nevada Forest Plan Amendment (Publication R5-MB-046, USDA Forest Service, 2004). The IDT completed an entire PFC process at locations where the condition was not in proper functioning condition, or where the condition was unclear at first glance. In areas that were obviously in proper functioning condition, we noted that the area was functioning properly, but that we did not always complete the entire PFC process at those locations.

Explanation of the Proper Functioning Condition Assessment Process
The following is an explanation of the purpose for and the process of completed PFC assessments. The information is from the US Department of the Interior, Bureau of Land Management publications:

- TR 1737-15, 1998; User Guide to Assessing Proper Functioning condition and the Supporting Science for Lotic Areas: and
- TR 1737-16 1999, revised 2003; User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas.

For a full explanation of the PFC protocols, please see the above publications.
Proper Functioning Condition (PFC) is a qualitative method for assessing the condition of riparian-wetland areas. The PFC assessment refers to a consistent approach for considering hydrology, vegetation and erosion/deposition (soils) attributes and processes to asses the condition of riparian-wetland areas. A checklist is used for PFC assessment (see pages 4 and 6 of this appendix), which synthesizes information that is foundational to determining the overall health of a riparian-wetland system. This checklist has a series of “Yes” and “No” questions that the ID Team works together to answer.

PFC is a qualitative assessment based on quantitative science. The PFC assessments for this project were performed by a trained and experienced interdisciplinary (ID) team, which meets the intention of the protocol. A PFC assessment is not to be used as the sole method for assessing the health of aquatic or terrestrial components of a riparian-wetland area, and is used only to assess the physical aspects of the system, not the habitat quality, although it gives clues about habitat quality. PFC assessment is not a substitute for long-term monitoring, but can be a part of a larger monitoring program.

There are two types of PFC evaluations; lotic and lentic. Lotic evaluations are completed on riverine systems, which, in our evaluations, consisted of streams and spring channels. Lentic evaluations are completed on riparian-wetland areas without a river or stream system, which, in our evaluations, consisted of wet meadows, fens, and the areas surrounding lakes, ponds, and vernal pools. In some of the meadow areas evaluated, where the meadow contained both lentic and lotic systems, we completed both a lentic and lotic PFC assessment.

Riparian-wetland areas can be rated as Properly Functioning, Functional at-risk, or non-functional. A functional-at-risk riparian-wetland area can be classified as have an upward trend, a downward trend, or no apparent trend. There is no set number of "yes" or "no" answers that dictate that an area is at-risk or nonfunctional. If all of the answers on the checklist are "yes", the area is obviously properly functioning. If all of the answers are "no", it is obviously non-functional. With any other combination of "yes" and "no" answers, the ID Team must determine whether the area meets the following criteria for each rating.

Lotic Functional Ratings
Proper Functioning Condition
A properly functioning riparian-wetland area will provide the elements contained in the definition:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve flood-water retention and ground water recharge
- Develop root masses that stabilize streambanks against cutting action

In accordance with its capability and potential
The riparian-wetland area does not need to meet its desired condition or its capability to be properly functioning.

Functional at-risk
Riparian-wetland areas that are in functional condition, but an existing soil, water or vegetation attribute makes them susceptible to degradation.
Trend must be determined, if possible, when a rating of functional at-risk is given. Preferably, trend is determined by comparing the present situation with previously collected information (photos, documents, past PFC assessments, other information). In the absence of information prior to the assessment, indicators of "apparent trend" may be deduced during the assessment process. In our analysis, we almost always had to deduce an "apparent trend" due to lack of previous information.
If there is insufficient evidence to make a determination that there is a real upward or downward trend, then the trend is rated "not apparent".

Nonfunctional
Riparian-wetland areas that clearly are no providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, etc.

Lentic Functional Rating
Properly Functioning Condition
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 floodplain 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 the water depth, duration, and temperature necessary for fish production, water bird breeding, and other uses; and
- Support biodiversity

Functional at-risk
Riparian-wetland areas that are in functional condition, but an existing soil, water or vegetation attribute makes them susceptible to degradation.
Trend must be determined, if possible, when a rating of functional at-risk is given. Preferably, trend is determined by comparing the present situation with previously collected information (photos, documents, past PFC assessments, other information). In the absence of information prior to the assessment, indicators of "apparent trend" may be deduced during the assessment process. In our analysis, we almost always had to deduce an "apparent trend" due to lack of previous information.
If there is insufficient evidence to make a determination that there is a real upward or downward trend, then the trend is rated "not apparent".
Nonfunctional
Riparian-wetland areas that clearly are no providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, etc.

Standard Checklist (Proper Functioning Condition-Lotic)

Name of Riparian-Wetland Area: _____

Date: _____ Segment/Reach ID: _____

Miles: _____ Acres: _____

ID Team Observers: _____ _____

Yes	No	N/A	HYDROLOGY
			1) Floodplain above bank full is inundated in "relatively frequent" events
			2) Where beaver dams are present they are active and stable
			3) Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bio-climatic region)
			4) Riparian-wetland area is widening or has achieved potential extent
			5) Upland watershed is not contributing to riparian-wetland degradation

Yes	No	N/A	VEGETATION
			6) There is diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery)
			7) There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)
			8) Species present indicate maintenance of riparian-wetland soil moisture characteristics
			9) Stream bank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high-stream flow events
			10) Riparian-wetland plants exhibit high vigor
			11) Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
			12) Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)

Yes	No	N/A	EROSION/DEPOSITION
			13) Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
			14) Point bars are re-vegetating with riparian-wetland vegetation
			15) Lateral stream movement is associated with natural sinuosity
			16) System is vertically stable
			17) Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

(Revised 1998)

Remarks

_____
_____
_____

Summary Determination

Functional Rating:

Proper Functioning Condition _____
Functional - At Risk _____

Nonfunctional _____
Unknown _____

Trend for Functional – At Risk:
Upward _____
Downward _____
Not Apparent _____

Are factors contributing to unacceptable conditions outside the control of the manager?
Yes ____
No ____

If yes, what are those factors?

____ Flow Regulations ____ Mining Activities ____ Upstream cannel conditions
____ Channelization ____ Road Encroachment ____ Oil field water discharge
____ Augmented flows ____ Other (specify) _____

Lentic Standard Checklist (Proper Functioning Condition) (Revised 1999)

Name of Riparian-Wetland Area: _____

Date: _____ Area/Segment ID: _____

Miles: _____ Acres: _____

ID Team Observers: _____

Yes	No	N/A	HYDROLOGY
			1) Riparian-wetland area is saturated at or near the surface or inundated in "relatively frequent" events
			2) Fluctuation of water levels is not excessive
			3) Riparian-wetland area is enlarging or have achieved potential extent
			4) Upland watershed is not contributing to riparian-wetland degradation
			5) Water quality is sufficient to support riparian-wetland plants
			6) Natural surface or subsurface flow patterns are not altered by disturbance (i.e. hoof action, dams, dikes, trails, roads, rills, gullies, drilling activities)
			7) Structure accommodates safe passage of flows (e.g. no headcut affecting dam or spillway.

Yes	No	N/A	VEGETATION
			8) There is diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery)
			9) There is diverse composition of riparian-wetland vegetation (for maintenance/recovery)
			10) Species present indicate maintenance of riparian-wetland soil moisture characteristics
			11) Vegetation is comprised of those plants or plant communities that have root masses capable of withstanding wind events, wave flow events, or overland flows (e.g. storm events, snowmelt)
			12) Riparian-wetland plants exhibit high vigor
			13) Adequate riparian-wetland vegetative cover is present to protect shoreline/soil surface and dissipate energy during high wind and wave events or overland flows.
			14) Frost or abnormal hydrologic heaving is not present.
			15) Favorable microsite condition (i.e., woody material, water temperature, etc.) is maintained by adjacent site characteristics)

Yes	No	N/A	EROSION/DEPOSITION
			16) Accumulation of chemicals affecting plant productivity/composition is not apparent
			17) Saturation of soils (i.e., ponding, flooding frequency, and duration) is sufficient to compose and maintain hydric soils)
			18) Underlying geologic structure/soil material/permafrost is capable of restricting water percolation
			19) Riparian-wetland is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)
			20) Island and shoreline characteristics (i.e. rocks, coarse and/or large woody material) are adequate to dissipate wind and wave event energies

Remarks

_____
_____
_____

Summary Determination

Functional Rating:
Proper Functioning Condition _____
Functional - At Risk _____
Nonfunctional _____
Unknown _____

Trend for Functional – At Risk:
Upward _____
Downward _____
Not Apparent _____

Are factors contributing to unacceptable conditions outside the control of the manager?
Yes ____
No ____

If yes, what are those factors?
____ Dewatering ____ Mining Activities ____ Watershed condition
____ Dredging activities ____ Road Encroachment ____ Land ownership
____ Other (specify) _____

Destination Attribute Protocol

Attribute Rating System
Description
- Montane
- Wet Meadow
- Alpine
- Lodgepole/Whitebark
- Lodgepole
- Whitebark

Recreation Category
- Rec Category 1
- Rec Category 2
- Rec Category 3

Consistent with Rec Category
Y – yes, current condition is consistent with standards and guidelines and desired condition of area
N1 – No, current condition is not consistent with S&G's and desired condition, it fits a Rec category 1 better
N2 – No not consistent, fits a Rec Category 2 better
N3 – No, not consistent, fits a Rec Category 3 better

System Trail
- 0-5 See Trail
- 5 is most severe resource concerns

Use Trail Rating
- 0-5 See Use trail rating protocol
- 5 is most severe resource concerns

Access issues
- 0 – none
- 1 – few, or low level concerns
- 2 – moderate concerns
- 3 – high or severe concerns

Riparian
- 0 – none
- 1 – low level concerns, few localized or isolated impacts
- 2 – moderate concerns such as some compaction, nickpoints evident, or small headcuts
- 3 – high or severe concerns, such as severe chiseling or trampling of streambanks, active headcuts , severe compaction with some alteration of hydrologic function

Fens (this information will be updated summer 2004)
- 0 – No indicator plants present, not a fen
- 1 – Sphagnum or other indicator present in patches, other fen characteristics (soil) not present
- 2 – Fen. Indicator plant species present, deep fibric soil (>40 cm thick)

TEPS Wildlife
- 0 – none
- 1 – suitable, TEPS habitat
- 2 – Occupied TEPS habitat but not conflict with current use
- 3 – Occupied TEPS habitat, conflicts with use

TEPS Plants
- 0 – none
- 1 – suitable TEPS habitat, no TEPS plants known
- 2 – Occupied TEPS habitat but not conflict with current use
- 3 – Occupied TEPS habitat, conflicts with use

Heritage
- 1 – no concerns
- 1 – low concerns, no visible values. No immediately observable impacts
- 2 – moderate concerns, some flakes or other artifacts present
- 3 – high concerns, previously recorded sites or sites found during ID team visit

Tribal
- 0 – no concern
- 1 – concerns

Management Actions
- 0 – none needed
- 1 – none taken, some minor actions needed
- 2 – none taken , moderate actions needed
- 3 – some taken, more needed
- 4 – significant actions taken, additional actions needed
- 5 – significant actions taken, more than some needed

Character Qualities
- 0 – high wilderness character, sense of remoteness, naturalness and appears pristine and undisturbed.
- 1 – high wilderness character, sense of remoteness, naturalness, but not necessarily pristine and undisturbed
- 2 – moderate wilderness character – scenic but slight disturbance, not pristine but not heavily impacted
- 3 – low wilderness character, sense of disturbed environment, unnatural, not secluded or remote

Solitude
- 0 – very high level of solitude
- 1 – high level of solitude
- 2 – moderate levels of solitude
- 3 – low levels of solitude

Recreational Impacts (not including system trail impacts)
- 0 – no recreational impacts noticeable, evident

- 1 – low level of rec impacts noticeable, evident
- 2 – impacts noticeable and evident, but moderate in severity
- 3 – moderate to severe recreation impacts noticeable, evident

Camping Potential (capacity)
- 0 – high capacity
- 1 – moderate capacity
- 2 – limited, low capacity
- 3 – Very limited, or increase would effect solitude, rec category desired condition

Camping Impacts (overall campsite condition rating and density of sites)
- 0 – none
- 1 – few
- 2 – some noticeable to moderate severity (condition class 3 average, more than 15 sites)
- 3 – many and/or some severe

Grazing
- 0 – no grazing occurring presently
- 1 – grazing occurring with low concerns
- 2 – grazing occurring with moderate concerns
- 3 – grazing occurring, high concerns with the grazing activity

Risk Factors (RCO's, sensitivity and fragility of environment with use)
- 0 – no risks apparent
- 1 – low risks, few concerns if use remains as is
- 2 – moderate concerns, and/or some factors showing early warning signs
- 3 – serious concerns that continued use will lead to deterioration of conditions, unless mitigations are put into effect.

Riparian Conservation Objectives
- 0 – full compliance with resource objectives
- 1 – few instances of non compliance or slight infractions of 3 or fewer RCOs
- 2 – moderate level of non-compliance with any RCO, or slight non compliance with more than 3 RCOs'
- 3 – severe non-compliance with any RCO

Destination Attribution Worksheet

Site Name			
Date			
RMU		Analysis Unit	
Elevation			
Field Investigators			
Description			
Rec Category			
Consistent w/RC			
System Trail			
Use Trail			
Access Issues			
Riparian			
TEPS Wildlife			
TEPS plants			
FENS			
Heritage			
Management Actions			
Character Qualities			
Solitude			
Rec Impacts			
Camping Potential			
Camping			

Impacts	
Grazing	
Risk Factors	
RCO's	

System Trail Assessment and Monitoring Protocols

Objectives: Assess effects of system trails and trail users on resources in trail corridor.
System Trail A system trail is recognized on the forest transportation inventory (most recently updated in the AA/JMW Plan Appendix C). System trails are designated with Trail Class rating that indicates level of development and maintenance considerations. Refer to National Trail Management Classes for further detail.

Trail Surveys
This resource impact survey may be done at a variety of intensities or as part of other surveys. If done as part of a standard trail log survey, both GPS and cyclometer may be used for locations. Conversely, a "Hasty Survey" method may be used, with locations estimated through reckoning, pacing, or location references. The Hasty Survey method is used during IDT field visits.
Using the most current inventory data and atlas for the trails to be surveyed, determine Trail Class, beginning and end termini, etc. Prefield, determine spur hierarchy and classes. Overlay Recreation Category map to highlight possible inconsistencies between Trail Class level and Recreation Category level. Use this information when making recommendations about level of development or prescriptions for repairs.
When conducting Trail Surveys and Prescription Logs for Deferred Maintenance, data will be recorded on standard handwritten trail log forms. The IDT may use various methods of note-taking when conducting Hasty Surveys. A cover sheet and resource data form will also be filled out for each trail, summarizing recommendations and observations for the entire trail, including whether the trail condition is substandard, the presence of resource concerns, prescriptions for repair, and whether the Trail Class designation seems appropriate to the level of development and use.

Photo Points
All stream crossings and areas of severe resource impacts or representative conditions will be photographed. Track photo points by cross referencing to waypoints, cyclometer readings or maps or a combination.

Individual Features and Severity Ranking
Point features indicate specific problems found on the route. For high-intensity surveys, use GPS unit for capturing locations at each stream crossing and "severe" resource-damage areas. Use cyclometer to record other evidence of trail-related resource impacts. The rating number will indicate the degree of resource impact. Linear features will have associated distance figures with them (i.e., <50 ' or >200').
Rating Key Note: For all types and rankings in this process, choose the most appropriate severity, whether all or only most components match exactly (some may not be present at each resource problem).
Slight = 1 = generally impacts are light and what would be expected on a stable system trail. Generally stable with some slight risk of degradation.
Moderate = 2 = a definite problem is occurring, and may be somewhat unstable with potential to become more serious, but not clearly dynamic.
Severe = 3 = serious resource problem (ie evidence of direct impacts vegetation, soil, etc) that is in state of advanced instability requiring immediate attention (same season or next). Risk factors (such as steep slopes, riparian habitat) exist that increase the instability or deterioration rate of the problem.

Individual Indicator Rating Key

A. Tread Widening: [NOTE: refer to Trail Class Definitions and Draft Design Parameters for appropriate tread width.]

1=slight= Tread widening is occurring - at least 2 times appropriate width for 50' or more, but is occurring in dry and sandy or upland soils with little impact to vegetation and little soil compaction. Trail is likely to become wider.

2=moderate= Trail widening is occurring @ 2-4 times appropriate width, in an area of riparian vegetation for more than 25', causing moderate damage to riparian vegetation and sod, and/or some soil erosion is occurring in dry areas where soil productivity is affected. Potential for increased damage likely.

3=severe= Trail widening >4 times appropriate width for more than 25' within a wet riparian/meadow area or adjacent to a stream crossing causing severe damage to sod with active erosion occurring. Condition is in a highly active state and has a potential to become worse rapidly. In upland areas soil productivity appears seriously affected.

B. Multiple Trailing: (through wet and sensitive areas or in uplands if impacting watershed)

1=slight= Multiple trailing is occurring (two or more trails), only minimal rutting or erosion is present. Not in an advanced condition, or seems to be generally stable; not likely to rapidly proliferate to additional trails.

2=moderate= Two to three trails have formed, some moderate damage has occurred to sod and riparian vegetation, trails incised >6" with some evidence of erosion and sedimentation within/from the trail troughs. Condition has potential to substantially worsen.

3=severe= Two or more trails have formed, with deeply incised troughs (>24" for extended distances) , with substantial loss of sod and damage to riparian vegetation. Erosion is highly active and dynamic, and sediment transport is evident and is directly affecting streams at crossings or nearby parallel streams.

C. Trail Incision:

1= Tread is moderately incised – 6"-12". Slight root exposure is noticeable, but trail generally appears to have stabilized at this depth, with only minimal soil transport evident.

2= Tread depth shows some active erosion and the trail is incising. Tread is greater than 12 inches below ground surface. Evidence of sediment and/or scour is leaving the trail and may be entering stream channels where trail is adjacent to streams. No evidence that erosion is slowing, waterbars and retaining structures not effective at stabilizing tread.

3= Trail is rapidly eroding and incising; gullies are present. Tread is greater than 24 inches below ground surface. Sides of gullied trail appear to be collapsing, with ripple effects to surrounding surfaces. Gullies are leaving trail causing severe erosion above and below trail. Evidence of direct sediment transport into stream channels at crossings or nearby streams is apparent.

D. Stream Crossings: (perennial, seasonal and ephemeral) [NOTE: In determing severity levels below, use caution in estimating stream width beyond natural channel width, since stock trails will generally cross at the naturally widest/slowest reach of stream, for ease and safety. Narrow natural channels may have a slightly higher acceptable factor of widening and downstream recovery. Streams with very wide natural channels (25-50') should not show as high a factor of widening at crossings, and should be rated more severely if extensive widening is occuring.]

1= Slight Entry to stream channel shows signs of bank instability, such as muddy entries or some tread widening, but most of the bank and trail integrity is intact. Erosion of the trail entry and

streambank scour is minimal. Channel width is less than twice natural channel width. Stream channel width and characteristics (such as depth, bank structure, vegetation, stream bottom material) return to normal within the distance of one natural channel width downstream of trail edge.
2= Moderate - Entry to stream channel is showing moderate erosion or instability and tread is widened. Channel is more than twice the width of normal average channel width, and may continue to widen. Streamside vegetation outside of trailway is becoming impacted. Some scour of banks related to trail is evident. Stream channel width and characteristics (such as depth, bank structure, vegetation, stream bottom material) return to normal within the distance of two natural channel widths downstream of trail edge.
3= Severe - Entry to stream channel is entrenched and showing severe, active erosion. Stream channel is well over twice natural width, and appears to be actively widening. The trail is more than three times normal width and/or has multiple eroded points of entry. Severe bank scour is eroding trailway and banks on either side of trail. Streamside vegetation is impacted and large areas of sod and soil are missing. Stream channel width and characteristics (such as depth, bank structure, vegetation, stream bottom material) return to normal in excess of the distance of three natural channel widths downstream of trail edge.

E. Trail causing water diversions:
1= Slight water diversion occurring at point causing light erosion of trail surface, potential for erosion to worsen but trail is holding up. Few or no signs of parallel trailing/detouring.
2= Moderate water diversion onto trail is occurring causing moderate trail erosion of trail surface, potential for serious trail damage. Traffic is favoring sides of trail for passage, with first stages of parallel trails (compacted veg and soils, but no incision). Sediment transport into stream channels where streams are adjacent.
3= Large flows of water are diverted onto trail causing serious trail erosion and gullying, substantial sediment delivery to nearby streams trail is in a degraded state, and well-formed parallel trails have formed outside of main trail.

F. (Vegetation) N/A for System Trails

G. Spring and Seep Crossings:
1= At crossings trail is starting show some widening, sod is partially disturbed. Water may be partially filling trailway. Some bypassing of wet trail is apparent.
2= At crossings trail is widening, some signs of multiple trails are forming, traffic is starting to bypass trail to the side, water may be becoming muddy or turbid. Some sod is being damaged along trail edges. Trampling and chiseling is evident.
3= Trail is widened and eroded, muddy, significant sod amounts are missing from trail edges, riparian vegetation appears to be trampled, multiple trails are present. Poor drainage of water at crossing is evident.

H. Other Indicators – Headcuts, pooling, or trampling outside of trail tread:
1= Small problems are occuring in or adjacent to trail. Not rapidly changing; appears stable with little risk of increasing.
2= Problems are present and active, causing some effects off trail – including gullying, loss of vegetation. Potential for increased problems unless section receives incidental treatments/repair.
3= Serious resource problem that is widespread, dynamic and unstable, with potential to become worse rapidly. Collapsing sod outside of trail tread, deep gullying, substantial loss of soil, or other indicators show severe effects to resource condition.

Overall Trail/Segment Assessment Key

Use these to rate the overall resource characteristic of the trail segment, such as drainage structure condition and function, presence of erosion (especially near riparian or streams) and overall stability of the trail. In general, conditions which are stable will have a lower severity rating than those which are in an active or dynamic condition. Trail sections will be evaluated using severity codes 0-5 (see below).

0 = Trail is highly stable, has no notable adverse affects on resources and no outstanding risk factors that would likely affect stability.

1 = Few notable resource problems, and trail is generally stable. Drainage is generally functional, and/or waterbars and tread retainers are generally functional and properly spaced to protect trail and resources. Maintenance should keep trail sustainable and stable.

2 = Trail has some erosion problems (rated at less than "3") over short stretches of trail. No severe water quality or soil erosion problems or direct effects on riparian. Most drainage is functional and structures (if present) are appropriately spaced, though some may need some repair before they fail or a few more structures are needed, though major damage is not yet occuring. There is limited damage outside of the main trailway related to trail use.

3 = Trail shows some signs of instability and resource problems – including some short, isolated problems rated at "3" – but much of trail is basically stable. In some areas drainage has failed and erosion is occuring, and/or drainage structures are borderline functional and are in need of replacement. Some off-trail effects caused by the trail are present in near corridor (<5' from trail edge). Some risk factors such as steepness, loose soils or riparian habitat indicate potential for further instability along certain parts of the trail.

4 = Trail shows moderate to high instability and resource problems – including some (at least 3-4 in a mile) rated at "3" – on substantial parts of the trail. Drainage is not functional (or structures have failed, where present), and long sections of trail have become entrenched, with high potential to erode further. Trail condition is actively and directly affecting riparian, water, or meadow conditions outside of trail corridor. A combination of moderate intensity risk factors, such as steepness, loose soils, surface water and substantial riparian habitat connectivity indicate potential for further instability.

5 = Majority of trail is in a severe state of degradation, and is causing consistent and widespread impacts to a variety of resources. Most severe impact areas are directly and heavily impacting stream channels, riparian and meadow habitats. Damage may extend well outside of trail corridor. Consistent intense risk factors, such as extremely steep slopes, steep grades (>20%) for long distances, loose soils, or proximity to streams and riparian increase the instability and dynamic risk of trail failure and resource degradation

Use Trail Monitoring Protocols [Protocols used for intensive surveys by trained technicians.]

Objectives: Overall assessment and location of user trail related resource impacts.

Trail Sections/Segments
First indicate on field map sections of trail surveyed. A section could be the distance between two main points such as trail intersections or between major stream crossings, drainages, destinations, etc., approximately .5 - 2 miles in length. In some instances (ie between to lakes or attractions) a large number of social trails exist and conditions and density are sampled in the area, rather than mapping each individually. In this situation draw a polygon on the map representing the area surveyed and record points within the polygon (also give the polygon a general condition rating as you would a trail section). Select segments based topographic , condition or social (destinations) features.
Each trail section will recieve an overall rating for the trail/segment impacts and then individual point features along the trail will also be identified.

Photo Points
Rather than photo documenting all point features, select representative spots to photograph. Use photos and stop points marked on topo maps to document problem and/or good areas. Track photo points by cross referencing to waypoints.

Point and Line Features
Point features indicate specific problems found on the route. Use GPS unit for capturing waypoint on each point feature. The letter code will indicate the type of problem or feature such as an impacted stream crossing, seep or spring degradation, widened trail, etc... The number will indicate the degree of resource impact. Linear features will have associated distance figures with them (i.e., < 50 ' or > 200').
Slight = 1 = generally impacts are light and what would be expected under light to moderate use, but possibly with indications that the condition is at risk or has potential to worsen.
Moderate = 2 = a definite problem is occurring with potential to become a major problem.
Severe = 3 = serious resource problem (ie evidence of direct impacts to water quality or sediment delivery to stream or lake) that is in state of advanced instability requiring immediate attention (same season or next). Risk factors (such as steep slopes, riparian habitat) exist that increase the instability or deterioration rate of the problem.

Slopes: Measure the grade of trail using a clinometer and use the following criteria to assess risk.
1 = Slight= 0-5%
2 =Moderate = 5-15%
3 = Severe = 15%
Rating Key

A. Trail Widening:
1= slight= Trail widening is occurring > 24", but is occurring in dry and sandy or upland soils with little impact to vegetation and little soil compaction. Trail is likely to start becoming wider.
2=moderate= Trail widening is occurring >36”, and is occurring in an area of sensitive riparian vegetation, causing moderate damage to riparian vegetation and sod, some moderate soil erosion

is occurring or along dry,upland areas where the soil surface is disturbed >36". Potential for increased widening is likely.
3=severe= Trail widening > 36" within a wet riparian/meadow area or adjacent to a stream crossing causing severe damage to sod and active erosion is occurring. Condition is in an active state and has a potential to become worse. Upland areas also where sandy soils are disturbed to >48".

B. Multiple Trailing:
1=slight= Multiple trailing is occurring (minimum 2 trails, minimal rutting or erosion is present. Not in an advanced condition.
2=moderate= Two to three trails have formed, some moderate damage has occurred to sod and riparian vegetation, some erosion is occurring within the trail troughs. Potential for worsening condition.
3=severe= Two to three trails or more have formed, have deeply incised troughs, loss of sod and damage to riparian vegetation is occurring. Erosion is active and evidence of sediment transport is evident and is entering channels where condition is crossing streams.

C. Trail Incision:
1= Slightly depressed trail tread is evident (usually < 2 inches). Slight root exposure may be noticeable. No evidence of soil erosion reaching water.
2= Tread shows active erosion and the trail is moderately incising (approx. 2-6 inches). Sediment may be leaving the trail, possibly entering streams or other water bodies but only in small amounts. Sediment accumulations in water bodies negligible or absent. Trail beginning to gully, but nearly all traffic remaining on main trail. Moderate root exposure may be evident.
3= Trail is actively eroding and incising (> 6 inches), leaving a gullied trail. Gullies may be leaving trail causing erosion above and below trail. Evidence of sediment transport into stream channels or other water bodies may be evident; sediment accumulations may also be present. Trail is in an eroded state and difficult to walk. Traffic favoring sides of trail for passage. Hanging roots evident along sides of trail.

D. Stream Crossings: (perennial, seasonal and ephemeral)
1= Entry to stream channel is starting to show signs of bank instability, but most of the bank integrity is intact. Erosion of the trail entry to the stream is minimal, some widening of the channel width has occurred (up to 1/2 more width than the normal width).
2= Entry to stream channel is showing moderate erosion of stream banks and channel starting to widen. Some sediment is reaching channel from erosion, channel is widening > 1 stream width of normal channel width. Streamside vegetation is becoming impacted, a loss of sod and soil has occurred. Rutting of trail at entries to channel has started to form, and is well defined. Scour has occurred during high flows.
3= Entry to stream channel is showing severe erosion of stream banks and is widening at stream edge or channel has widened > 2 normal stream widths. Streamside vegetation is impacted and large areas of sod and soil are missing. Rutting of trail at entries to channel is deeply incised and actively eroding. Substanial sediment entry to channel is obvious from trail. Trail entry may be causing diversion of water onto the trail to the sides of the crossing and causing scour, branching of flow and widening of the channel.
* use caution in estimating stream width above normal since often horse crossings will naturally choose the widest part to cross for ease of crossing

E. Trail causing water diversions:

1= Water diversion occurring along user trail during the runoff portion of the year only. Trail generally located in upland environment with no streams or meadows nearby. Water does not stay on trail for long (>50 ft.) distance. Trail usually dry after snowmelt or rainstorm has passed.
2= Water diversion onto trail is occurring for a portion of the year. Streams, lakes, or meadows are adjacent to trail diversion or water stays on trail for long (> 50 ft.) distance. Sediment transport may be occurring into stream channels or other water bodies where adjacent.
3= Water is diverted onto trail from a perennial water source, generally a perennial stream, lake, or meadow, and water is on trail for most of the summer. Trail generally in an degraded state (see C, Trail Incision).

F. Vegetation and sod damage
1= Sod and vegetation has slight evidence of vegetation loss or crushing. If light use evidence of healing may be present.
2= Sod and vegetation has moderate to severe vegetation loss or crushing.
3= Severe loss of sod and vegetation with missing sod and erosion present. Evidence of dead or dying shrubs or vegetation.

G. Spring and Seep Crossings:
1= At crossings trail is starting show some widening, sod is partially disturbed. Water may be partially filling trailway. Some bypassing of wet trail is apparent.
2= At crossings trail is widening, some signs of multiple trails are forming, traffic is starting to bypass trail to the side, water may be becoming muddy or turbid. Some sod is being damaged along trail edges. Trampling and chisling is evident.
3= Trail is widened and eroded, muddy, substanial sod amounts are missing from trail edges, riparian vegetation appears to be trampled, multiple trails are present. Poor drainage of water at crossing is evident.

H. Headcuts and Nickpoints associated with trail:
1= Small headcut or nickpoint has formed within trail or adjacent to trail. Not incising, appears stable but has the potential to increase.
2= Active headcut has formed and is actively eroding and has an incised gully below headcut. Potential for headcut to increase in size and increase gullying. Some small nickpoints are associated along the gully edges.
3= Active headcut with a deeply incised gully below. Soil and or sod has been lost to headcutting in or within riparian areas.

Overall Trail/Segment Assessment Key
These are used to rate the overall characteristics of the trail section (or polygon), such as waterbar/drainage structure condition and function, trail structure condition, and general trail conditions. The trail sections will be evaluated as Code 0, 1, 2 or 3 (see below).
0 = No significant water quality or soil erosion problems, trail is barely visible, may not even persist from year to year.
1 = Trail persists from year to year and is clearly visible. No significant water quality or soil erosion problems, i.e.

- Drainage structures (natural waterbars, outsloped areas) are working and appropriately spaced, water and sediment are directed into nearby vegetation and filtering out before reaching live streams or within a few hundred feet.
- There is no (or very minimal) off site/off trail damage occurring related to trail use.

- There are no drainage structures, but no evidence of rilling or water running down and off trail or causing offsite impacts.
- Waterbars are broken or failing but not causing offsite impacts at this time.

2 = Some evidence of water concentrating on trail or small rilling or rutting with potential for increase (unstable), trail may need maintenance, but only a few to no obvious or significant watershed problems related to the trail, i.e.

- Lacks natural drainage structures and shows evidence of rilling, concentrated water flow etc. Minor off trail impacts.
- Minor off trail impacts over short lengths of trail, no evidence of water/sediment reaching stream courses or lakes.

3 = At least 1-2 significant water quality problem areas within a or trail generally in poor condition with malfunctioning drainage and offsite impacts, some reaching live water courses or ephemeral draws.

- Multiple trailing through a meadow or seep area dislodging sediment into an ephemeral or perennial channel.
- Severe gully erosion in trail or headcutting associated with trail.
- Lacks drainage structures and shows evidence of significant off trail and on trail impacts due to concentrated water and sediment delivery to streams.

4= At least 3-4 significant water quality problem areas within a mile or trail generally in poor condition with malfunctioning drainage and offsite impacts, some reaching live water courses or ephemeral draws.

Same indices as above

5=At least 3-4 significant water quality problem areas within a mile or trail generally in poor condition with malfunctioning drainage and offsite impacts, some reaching live water courses or ephemeral draws.

Same indices as above

Use Trail Assessment Rating Key IDT - 2003

[Rating guide for assessing overall resource condition with Hasty Surveys conducted by the ID Team.]
Objectives: Assess the overall condition and impacts to resources by non-system trails.

INDIVIDUAL FEATURES AND RESOURCE INDICATORS:
Note: For all types and rankings in this process, assign the most appropriate severity, whether all or most components match exactly (some may not be present at each resource problem).

Resource Indicators:
A. Tread Widening
B. Multiple Trailing (through wet and sensitive areas or in uplands if impacting watershed)
C. Trail Incision
D. Stream Crossings (perennial, seasonal and ephemeral)
E. Trail causing water diversions
F. Vegetation Impacts
G. Spring and Seep Crossings
H. Other Indicators – Headcuts, nickpoints, impacts outside of trail footprint associated with trail

Slight = 1 = generally impacts are light and what would be expected with light to moderate use. Impacts confined to relatively small footprint. Generally stable with some slight risk of further degradation.

Moderate = 2 = a definite problem is occurring, and may be somewhat unstable with some risk factors present, increasing the potential to become more serious, but not currently in a state of dynamic change.

Severe = 3 = serious resource problems (ie evidence of direct impacts to vegetation, soil, water quality, etc) that are in a state of advanced instability with high risk to resources if not physically treated. Substantial risk factors exist that increase the instability and likely deterioration rate of the problem.

RISK FACTORS:
These are natural and location-specific conditions which may create increased likelihood of rapid degradation and the severity of resultant impacts to resources. When multiple factors are present in a specific location, the combined effects will likely create a much higher overall risk.

Factors include:
• Steep (>25%) slopes
• Highly erosive soil types
• Shallow soils and limited soil development
• Steep trail grade (>20%) over long distances
• Alignment precluding drainage (bottom of gully, directly up slope, etc)
• Proximity and connectivity to riparian and water courses.

OVERALL USER TRAIL/SEGMENT ASSESSMENT:

Use these to rate the overall resource characteristic of the trail segment, taking into account resource indicators, risk factors, and overall stability of the trail. In general, conditions which are stable will have a lower severity rating than those which are in an active or dynamic condition. Trail sections will be evaluated using severity codes 0-5 (see below).

0 = Trail is highly stable, has no notable adverse affects on resources and no outstanding risk factors that would likely affect stability. Resource effects would heal naturally and quickly (approx 1 year).

1 = Few notable resource problems, and trail is generally stable. Drainage is generally functional. No major water quality or erosion problems. Water flows not captured for long periods, and are dispersed before reaching live streams. Limited off-trail effects. Few risk factors present which would likely cause instability.

2 = Some evidence of water concentrating on trail, with small rilling or rutting with some potential for increased damage. Trail has some erosion (rated at less than "3") over short stretches of trail, but no severe water quality or soil erosion problems or direct effects on riparian conditions. Off-trail impacts are minor and are limited to only short parts of the segment. There is limited damage outside of the main trailway related to trail use. Water/sediment is not deposited directly into live streams or lakes. Some risk factors present, but not combined in a way that would create rapid instability.

3 = Trail shows some signs of instability and resource problems – including some short, isolated problems rated at "3" and some of trail in poor condition – but much of trail is basically stable. In some areas erosion is occuring and some water and sediment is reaching live streams or lakes. Some off-trail effects caused by the trail are present. A combination of risk factors (as outlined at left) create the potential for rapid and/or continuing instability along certain parts of the trail.

4 = Trail shows moderate to high instability and resource problems – including some (at least 3-4 in a mile) rated at "3" – on substantial parts of the trail. Substantial areas of entrenchment are present on and off-trail due to uncontrolled hydrologic action and trail is in generally poor condition. Trail is actively and directly affecting riparian, water, or meadow conditions off-trail. A combination of moderate to high intensity risk factors indicate potential for rapid instability with possibility of severe effects to resources.

5 = Majority of trail is in a severe state of degradation, and is causing consistent and widespread impacts to a variety of resources. Most severe impact areas are directly and heavily impacting stream channels, riparian and meadow habitats. Off-trail effects, such as gullying, headcutting and collapse of sod extends well outside of immediate trail corridor. A combination of consistent and severe risk factors is increasing instability and the risk of dynamic trail failure and likelihood of severe resource degradation.

Trail Assessment – All Trails 2003 Field Form

Trail Name and Number:
Trail Class (App C):_____NS? _____ Miles: _____
Destination Area: _____ Rec Category: _____
Analysis Unit: _____ Red – Red/Yellow: _____
Termini: _____ Beginning:_____ Ending: _____
Survey Method (Mark all that apply): _____ Cyclometer____ GPS (file #)_____ Hasty Survey (Reckoning): _____
Surveyors: _____
Date: _____Time: _____

General Description – ie: What general path does the trail follow? Proximity to creeks or other features? Continuous or difficult to follow?

_____
_____
_____
_____

Photos Taken? Who?:

_____

For System Trails:

Does the trail level of development appear to generally meet the designated Trail Class? _____
If not, what is the apparent Trail Class/Level of Development? (Refer to Trail Class Definitions)

_____

Does the trail level of development appear consistent to the Rec Category of destination? _____

For All Trails:

Trail is existing & visible (generally continuous)? _____
Does the trail appear to have been designed/constructed? (graded alignment, etc) _____
Trail structures (walls, steps, etc) present? _____If non-system, does trail show past mgmt?

_____

Comments regarding Class or level of development – Recommendations?:

_____

Apparent Type and Level of Use: Apparent Use level – High, Med, Low, none – relative to Rec Category
Stock: _____ Hiker: _____
Does another system trail access destination? _____Trail Name and number:

Percent of trail length with high level of resource effect/instability (Areas with moderate to severe level of impacts and high instability in key indicators): %
Can the problems be readily addressed with moderate treatments and maintenance? _____
Are there risk factors or conditions present that are severe/sustained that may hinder construction or maintenance efforts? _____
Briefly describe repairs/issues:

_____
_____
_____

Special Considerations:
Botany:

_____
_____
_____

Soils:

_____
_____
_____

Hydro:

_____
_____
_____
_____

Wildlife:

_____
_____
_____

Heritage:

_____
_____
_____

What is overall trail resource condition rating? ____ What are the key indicators?

_____
_____

Other (Safety or other concerns, IDT recommendations/questions, future survey or followup, etc):

_____
_____
_____

RCO Concerns/Non-compliance_____

PRESCRIPTION: Type of work needed to meet standard for…

		minor med heavy
*Current Class with Stock Use	Light/no Repairs	<<1 2 3 4 5 6 7 8 9 10>>
	Extensive Reconstruction	
*Current Class Hiker only	Light/no Repairs	<<1 2 3 4 5 6 7 8 9 10>>
	Extensive Reconstruction	

"1" = Trail has few/no backlog needs for resource or infrastructure repairs.

"10" = Trail requires complete reconstruction, with many severe/difficult repairs and intensive reroutes.

		minor med heavy
**Annual Maint Needs - Stock Frequent/High	Minimal	<<1 2 3 4 5 6 7 8 9 10>>
**Annual Maint Needs - w/o stock Frequent/High	Minimal	<<1 2 3 4 5 6 7 8 9 10>>

Assumes trail was rebuilt to meet standard:

"1" = Few risk factors, easy to maintain. Low grades and slopes, stable soils, good alignment.

"10" = Many risk factors along much of trail. Steep grades and slopes, erosive soils,etc.

Optional Cost Estimate for entire trail…

Estimated Crew time for Complete Trail	Crew PPs to Repair or Reconst to standard	Annual Maint Days to meet standard	Estimated project $ (2002 $, no O/H)	
Current Class w/ stock				
Current Class w/ hiker				

Field Guidance for System and Use Trail Assessment Form

Header: Mostly self explanatory. For inventory data, make note of the Trail Class Levels shown in both the 1987 and the Appendix C Inventories. Destination area is general destination(s) of trail. Recreation category refers to the category of the destination. Analysis Unit should be the AU which is primarily accessed by the trail. If trail accesses multiple destinations and Analysis Units, make note of the secondary unit(s).

General Description: This is to distinguish this particular segment of trail from another, and to clarify the basic route of the trail. Traits of the trail or proximity to areas of concern, such as riparian or water, can also be identified in a general way, though these will usually be stated in the "Special Considerations" area.

Photos: Self-explanatory.

System Trails:
"Level of Development" and **"Apparent Trail Class":** Compare the current condition and development (features, grade, structures, trail width, etc) to the National Trail Class definitions.
"Consistency with Recreation Category": Does the current level of development appear to meet the designated Rec Cat and the needs of the destination? Is the trail serving the type and amount of use adequately, and without resource impacts caused by inadequate development? Conversely, does it appear that the trail is developed substantially more than needed for the apparent levels of use?

All Trails (includes use trails): Self-explanatory.

Apparent type and Level of Use: If there is no recorded use data available, evaluate the apparent amount of use. Consider how wide and compacted the trail tread is, how many social trails leave the system trail, how many camps are at destination, recent evidence of packstock use, manure, and numbers of encounters with various types of users that day. Compare this with the relative expectations of the Recreation Category (ie: in a RC1, very few visitors would be expected, so a small number may still be considered "High" use). The same number of visitors may be seen as "Low" use in a RC3 area.

Other trails accessing area: Used to evaluate whether there is duplication of either system or use trails into area.

P**ercent of trail with high level of resource effects:** Estimate the total length of trail that shows high level (either moderate or severe) impacts rated 2-3. Give approximate % of the estimated total trail length.

Problems repairable with moderate maintenance or treatments: Are most of the problems readily repaired with basic trail work or resource treatments. (ie: not a substantial reconstruction project).

Risk Factors: These are trail-specific conditions which create likelihood or potential for rapid trail or resource degradation and/or potential for severe impacts. The presence of multiple factors – especially when they are severe – creates a higher overall risk. Factors to consider: Steep trail grades (>25%), highly erosive soils (pumice), steep side slopes (>50%), alignment that precludes

drainage (ie: travels along bottom of gully), proximity and connectivity to riparian and water courses. If these appear to affect maintenance or repairs of the trail, state it here. Describe key risk factors and repairs in the **Repairs/issues area.**

Special considerations: Enter observations of specialists in the appropriate categories. If a professional specialist is not present, state this, and describe observations of non-specialist where appropriate.

Overall Resource Condition Rating: Using the corresponding System Trail or User-Trail assessment key, record the 0-5 rating for the total trail length. Consider the density % of moderate and severe impacts.

Other (safety and recommendations, etc): Record other observations, hazards, or questions about the trail here. If the team has suggestions for possible mitigation or reconstruction efforts that would solve issues, or recommendations regarding trail class or needs for future higher-intensity surveys, use this area.

Prescription: Rate on a scale of 1 to 10 the relative type/intensity of work needed in the listed categories, in order to bring trail to its designated Trail Class standard. When describing the "Annual Maint Needs", evaluate the trail maintenance likely once the trail is at standard. Assess based on risk factors present which would affect maintenance efforts. (Consider the Risk Factors and Repairs/Issues parts of the form)

Intensive Inventory

Campsite Field Inventory Form

Date ___/___/___

PAGE ____of____

Wilderness _____ Drainage _____

Location_____

Elevation _____

Landform _____

Campability: **Potential** _____% **Currently Used** _____%

Meadows _____

Social Trails _____

General Comments: _____
_____
_____

PART I

Application of rating factors for Condition Class Determination:

Campsite	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Density										
Total Area										
Barren Core										
Camp Development										
Social Trails										
Mutilations										
Mean Rating or Campsite Class										

PART II

Campsite Number (on map)	Condition Class	Location	Site Potential	Distance to water	Veg Cover	Firewood Availability	Long term Monitoring?	Photo	Comments
1									
2									
3									
4									
5									
6									
7									

Inventoried By _____

Campsite Inventory Criteria and Rating Factor

Density of Vegetation (with respect to surrounding vegetation)
1 - same as surroundings
3 - moderately less dense than surroundings
5 - considerably less dense than surroundings

Total Area of Campsite
1 - less than or equal to 20 ft (2 m)
2 - 21 to 100 ft (2 - 9 m)
3 - 101-500 ft (9 - 46m)
4 - 501 to 1,000 ft (93 m)
5 - greater than 1,001 ft

Barren Core Area
1 - absent
2 - 5 - 50 ft
3 - 51-200 ft
4 - 201 to 500 ft
5 - greater than 501 ft

Campsite development
1 - windbreaks and paraphernalia absent, trash and seats minimal; firerings absent or scarce
2 - trash, windbreaks, seats and firerings minimal; paraphenalia absent
3 - trash, windbreaks, seats mostly moderate; firerings mostly minimal; paraphernalia minimal
4 - trash, windbreaks seats firerings and paraphernalia mostly moderate, some heavy
5 - trash, windbreaks, seats, firerings, paraphernalia mostly heavily developed

Social Trails
1 - none
2 - 1 - 2
3 - 3 - 5
4 - 6-10 or 1-2 highly obtrusive
5 - 11 + 3 +/- highly obtrusive

Mutilations
1 - none
2 - 1 to 2
3 - 3 to 5
4 - 6 to 10 or 1-2 highly obtrusive
5 - 11 + 3 +/- highly obtrusive

Part II

Site Potential
OBL - obliterate
MT - maintain as is
C - containment, rehab, etc

Distance to Water
1 -- 100+ - greater than 100ft
2 ---50 - 100 ft
3 ---25 - 50 ft
4 --- 0-25 ft

Vegetation Cover Type

A	alpine	B	barren
WI	willow	WP	whitebark pine
WW	western white pine	H	mtn hemlock
L	lodgepole	R	red fir
J	juniper	JP	jeffery pine
WX	white fir/mixed conifir	P	pinon pine
PX	ponderosa	DX	doug fir/mixed confir
UP	upper chaparrel	LC	lower chaperel
AM	alpine /subalpinemeadow	LM	lower elev. meadow

Firewood Availability
1 - ground fuel very abundant or similar to nearby (control) areas; dead and downed wood very abundant within or immediatley adjacent (within 25 yards) of camp areas.
2 - Ground fuel abundant; dead and downed wood abundant within 100 yards of camp areas or moderately reduced from nearby areas.
3 - ground fuel intermediate dead and downed wood sparse to scattered within or immediately adjacent to camp areas. Scattered to moderately available within 150 yards. Moderately available to abundant beyond
4- Ground fuel sparse; dead and downed fuels absent or very sparse within and immediately adjacent to camp area. Occasional pockets of of sparse to moderate fuels may occur. Very sparse to scattered within 200 yards to camp area. Scattered to moderately available beyond.
5 - Ground fuel very sparse - absent ; dead and downed fuels absent from immediate vicinty of camp areas. Very sparse for a distance of more thatn 200 yards. Firewood obviously carried in fromlong distance (1/8 + mil

Packstation Use Data Worksheet

Packstation _____

Date _____

Prepared By _____

Analysis Unit	Destination	Number of trips 2003	People 2003	Stock 2003	Number of trips 2002	People 2002	Stock 2002
Spot/Dunnage Trips							
All-Expense Trips							
All-Expense Trips Expanded							

Need For Change Worksheet

Pack Station Permit Re-Issuance / CEA

Analysis Unit – XXXX

Existing Condition

Destinations

Destinations within analysis unit

Operations

Operations within analysis unit

Grazing/Meadows

Grazing/Meadows within analysis unit

Trails/System

System trails within analysis unit

Use Trails

Use trails within analysis unit

Campsites

Campsite within analysis unit

Cumulative Effects of Existing Condition

Need For Change

Conditions within the analysis unit that indicate a need for change

Proposed Actions

Proposed actions resulting from the need for change

Further Inventories Needed

Further inventories needed