

HELENA NATIONAL FOREST

# ANNUAL MONITORING REPORT

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F I S C A L   Y E A R   2 0 0 5

*April 2007*



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## Introduction

The purpose of this document is to report progress and findings of Forest Plan monitoring and monitoring completed as part of the Youth Forest Monitoring Program.

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### Forest Plan Monitoring

The Regional Forester approved the Land and Resource Management Plan for the Helena National Forest on May 2, 1986. A requirement of the Helena National Forest Plan (FP) is to monitor and evaluate activities to determine how well the Plan is being implemented. If monitoring and evaluation find significant deviations, the Plan will be amended based on the findings.

All Forest Plan monitoring requirements can be found in Table IV-1 on pages IV/6 through IV/19. This Forest Plan (FP) Monitoring Report was compiled from information received from resource personnel and is arranged in order of the resource elements from Table IV-1 of the Forest Plan.

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### Summary

The Forest Plan has a total of forty-eight monitoring elements. Each element is addressed in detail in this document. The Forest has evaluated each of the monitoring elements and found that our management is within the variability defined in the Forest Plan for thirty-seven of those elements.

This section summarizes the eleven monitoring elements where the variability measures described in the Forest Plan are not being met. The summary of the various reasons that the Forest is outside the variability for any given element are presented here. Each element is addressed in detail under individual elements in the main report.

Using the Forest Plan Decision Flow Diagram shown in Appendix A, only element D2, allotment management planning, is a Forest Plan monitoring element variation for which Forest management practices need to be changed to address. The recommended action to increase the number of allotment management plans that are being updated annually would meet the intent of element D2.

### MONITORING ELEMENTS OUTSIDE OF VARIABILITY

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#### Element A1

The Forest Plan requires that use and condition of developed recreation facilities be monitored and reported annually.

#### Variability Measure:

Forest Plan Monitoring Requirements state that any 20% variation in visitor use between projected and actual should be documented.

#### *Assessment:*

The estimated visitor use (based on NVUM surveys) at developed recreation sites in fiscal year 2003 was only 39% of the Forest Plan projection. The Forest is outside the variability defined in the Forest Plan for this element.

#### *Actions in response to variability assessment:*

Based on results of the 2003 National Visitor Use Monitoring Project, it appears the existing recreation use figures identified in the 1986 Forest Plan (based on the best available data at the time) and/or the

projected future growth estimates, were high. Recreation visitor use data utilized for Forest planning was obtained from the 1980 RIM (Recreation Information Management) Reporting System. It should be noted that RIM information was determined based on "best guess estimates" considering: employee observation, documented reports, weather conditions, and wildfire activity. While the RIM data was not systematically obtained and never validated, it was the best estimate of recreation use at that time. Future NVUM data, to be collected during FY 2008, will likely revise use figures on the Helena National Forest. A comparison at that time will provide a reliable analysis of the true variability of this element.

For this planning period, this Forest Plan element will continue to be reported. The 2003 NVUM survey information provide a reasonable baseline for this element. Once the 2008 NVUM data are available it will be meaningful to compare changes between the 2003 and the 2008 survey.

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#### Element C4:

Elk/mule deer habitat effectiveness (cover/forage, open road density, and livestock impacts on elk habitat potential) will be monitored to be able to respond to any unacceptable deviation from past measurements. This monitoring element is applicable to Management Areas L2, H1, H2, T2, T3, W1, W2, and E1 through E4.

#### Variability Measure:

-10% from previous measurements

##### *Assessment:*

This element has five primary sections.

##### Cover and Forage:

Changes in the amount of cover and forage between FY04 and FY05 are negligible at less than 1%. Based on the monitoring results, this portion of the element is within the acceptable variation of -10%.

##### Open Road Densities:

The changes between 1991 and 2003 indicate a reduction in road densities of 25%. Although this portion of the monitoring element exceeds the variability measure, the change is in a positive direction in terms of improving open road densities from a big game standpoint.

##### Road Closure Effectiveness:

Variable, based on landscape area. Variability can not be quantified because the assessment is based on field observations.

##### Habitat Effectiveness:

Variable, based on landscape area. Variability can not be quantified because the assessment is based on field observations.

##### Aerial Surveys:

There is a 37% decline in total numbers observed between 2004 and 2005 the changes are not related to a management oriented practice.

##### *Actions in response to variability assessment:*

There are no actions needed in terms of management changes at this time. The variability is either out of the Forest Service control, changing in a positive direction for this element or not quantifiable.

### Element C5

Bighorn sheep habitat suitability will be monitored to be able to respond from any unacceptable deviation from past measurement. This monitoring element applies to Management Areas W1, P1, and P2.

#### Variability Measure:

-10% from previous measurements

#### *Assessment:*

The variation reflected in the total number of bighorn sheep counted between 2004 and 2005 exceeds the acceptable variation of  $\pm 10\%$ . However, the population objective is 250 bighorn sheep for the Elkhorns. Therefore, this increase of 23% is desirable. All other variation is within  $\pm 10\%$ .

#### *Actions in response to variability assessment:*

There are no actions needed at this time.

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### Element D2

Monitor allotment management planning and update.

#### Variability Measure:

Less than 4 plans updated annually, planned objectives are not being met.

#### *Assessment:*

An average of less than one allotment management plan was updated from 2000 through 2005. This variability measure is not being met.

#### *Actions in response to variability assessment:*

The Forest needs to increase the number of allotment management plans that are being updated annually to meet the requirements of this element. Ten allotments are planned for updates in 2006, which will improvement movement towards meeting the requirements of this element.

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### Element D3

Monitor weed infestations

#### Variability Measure:

Noxious weeds increase distribution by 5%; other weedy species by 10%; infestations appear in previously unaffected areas (1986 Forest Plan).

#### *Assessment:*

The most recent weed EIS efforts inventoried 22,668 and 198 miles of infested roadside for a total of approximately 23,000 acres. Simple statistical calculations comparing the 1987 and 2006 weed EIS inventoried acres computes an annual spread rate of 10.75% over the past 19 years. These calculations exceed the variability identified in the 1986 Forest Plan for this element

#### *Actions in response to variability assessment:*

Noxious weed management efforts have been expanding since 1996 with peak years' center around the fire restoration activities of 2001 – 2003. Noxious weed infestations prior to 2001 and post 2003 have

and will continue to spread at a greater rate than the annual rate of control. The Forest will continue with aggressive weed control efforts to the greatest extent possible.

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**Element E1**

Volume prepared for sale.

**Variability Measure:**

Change (+/- 10%) in volume from 5-year base harvest schedule. No more than 25% of the sales located outside of scheduled 10-year plan.

***Assessment:***

Annual harvest volume prepared for sale and 5 year base harvest schedule variability exceeds +/- 10% of the Forest Plan base harvest schedule

***Actions in response to variability assessment:***

Direct effect (management oriented) on the Helena's ability to adhere to a 10-year schedule is due to the recent large scale wildfires, the National emphasis on ecosystem management and fuels related programs and less emphasis on maximizing timber production on timbered lands, thus resulting in fewer acres treated with the sole emphasis of timber production.

Policy has established that the ten-year sale program is an upper ceiling rather than a required output and therefore, this deviation does not require a Forest Plan adjustment at this time.

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**Element E2**

Timber assumptions: volume, productivity, condition class, slope, recovery, logging, acres harvested are validated and assumptions are correct in the Forest Plan.

**Variability Measure:**

Sale reviews question validity of assumptions + or - 15 % of Forest averages

***Assessment:***

Results of current board foot/cubic foot ratios indicate a lower ratio than originally predicted in the Forest Plan. This could be directly related to volume tables used in projections for the Plan and volume tables developed locally and used as part of the cruise program. Volume per acre projections in the Plan were primarily prioritizing regeneration harvest techniques and within the past 5 years the Helena has implemented primarily intermediate harvests and fire salvage which has resulted in a lower volume per acre than project in the Plan. The Forest Plan EIS projects 1,940 acres of harvest per year and the harvest is monitored for a five-year period. In 2005, the Helena Forest awarded sales resulting in less than 200 acres. Deviations below Forest Plan projections are acceptable and will be re-evaluated in the upcoming Forest Plan revision.

***Actions in response to variability assessment:***

No additional action is needed at this time.

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**Element E8**

Monitor timber stand improvements and assumptions.

**Variability Measure:**

The Forest Plan projects 280 acres of pre-commercial thinning per year with (1) less than 75% accomplishment of scheduled TSI in 5 years, or (2) less than 50% accomplishment per year

***Assessment:***

Since the Canada Lynx has been listed as a threatened species under the Endangered Species Act the timber stand improvement program within its habitat has been "on hold", awaiting the thinning treatment recommendations from the Northern Region Lynx Conservation strategy. Most of the stands scheduled for pre-commercial thinning are encompassed by the habitat needs of this species, per current management direction. In addition, there has not been funding for TSI projects in recent years. A deviation of management practices is observed.

Even considering the relative abundance of acres harvested, the Forest is not compliant with the TSI objective defined in the Plan. The Forest is not compliant with the acceptable variability of less than 75% of scheduled accomplishment in a five year period. The Forest has accomplished 0% this goal. Annually the Forest has accomplished less than 50% of the thinning objective.

***Actions in response to variability assessment:***

No additional action is needed at this time.

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**Element F4**

Insure availability of adequate water to maintain management options, water rights

**Variability Measure:**

Variability which would initiate action – Any change which would require acquisition of additional water rights

***Assessment:***

Forest action to acquire water rights for Snowbank Lake is necessary

***Actions in response to variability assessment:***

Apply for and obtain a water right for Snowbank Lake.

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**Element P4**

Wildfire acres burned are to be monitored annually and reported every 5 years.

**Variability Measure:**

Variation of +/- 25% above projected average of annual wildfire burned acres will initiate action

***Assessment:***

The variability on average is within acceptable limits if you do not count the large fire year of 2003 being above the 25% projected average of wildfire burned acres, if the large fire year of 2003 is considered the variability is outside of the acceptable range

***Actions in response to variability assessment:***

No change to monitoring element is necessary at this time. Large fires are heavily dependant on weather and drought patterns, large fires will continue to occur during periods of extended dry weather.

**Element P5**

Monitor annually the cost of suppression, protection, organization, and net value change Report every 5 years.

**Variability Measure:**

+/- 5% increase in real costs

***Assessment:***

Variability stated cannot be met annually as the true cost of suppression, protection and organization is beyond the control of the forest as an individual unit

***Actions in response to variability assessment:***

Continue current management direction which periodically re-evaluates fire staffing needs.

## Monitoring Reports

### (A) Recreation

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#### (A1) Developed Recreation

##### Forest Plan Requirements:

The Forest Plan requires that use and condition of developed recreation facilities be monitored and reported annually.

##### *Intent:*

The intent of that requirement includes: checking the accuracy of use-projections made during the Forest Planning process; monitoring closeness to capacities and determining if developed facilities are maintained to existing capacity and standards.

##### Data Sources:

2003 National Visitor Use Monitoring Report (NVUM); Forest Service Infrastructure & Deferred Maintenance Reporting System (INFRA); Fee Compliance Figures; Capital Investment Program; Employee Observations; Road Counters; Trailhead Registers; Special Use Authorizations; Results and information presented in the 2004 Monitoring Report.

The Recreation Information Management (RIM) system formerly utilized by the Forest Service to track visitor use was determined to be inaccurate and outdated. The agency now estimates visitor use every five years through implementation of the statistically valid National Visitor Use Monitoring Project.

##### Current Efforts and Findings:

##### *Documentation of monitoring methodology:*

The National Visitor Use Monitoring Project was developed to provide statistically valid use estimates. Through traffic counts (road & trail) and visitor exit surveys, recreation use information is obtained specific to the Helena National Forest.

Infra was designed to track facilities: their number, condition and associated costs. All recreation facilities are identified within the Developed Recreation database. At a minimum, condition surveys are accomplished every five years and the resulting information documented in Infra.

Fee compliance is accomplished primarily through implementation of a self service pay system at designated fee sites. Forest employees routinely monitor fee collections during the summer months to obtain visitor use figures.

Registration boxes are installed and maintained at both the Alice Creek and Indian Meadows Trailheads. Forest employees routinely monitor the registration boxes to note visitor use and comments.

##### *Monitoring Activity:*

The condition of developed recreation facilities is monitored through the Forest Service Infrastructure & Deferred Maintenance reporting system in I-Web, referred to hereafter as the Infra database. Over a five-year period, condition surveys are accomplished at all developed recreation facilities. These surveys identify the number and condition of recreation facilities. The resulting information is entered into the Infra database and revised as changes occur within the developed sites.

Condition surveys were last completed at all developed recreation sites on the Helena Forest during fiscal year 2004. Information regarding the condition of recreation facilities was documented in the Infra database prior to the end of the fiscal year. Because condition surveys are not required again until fiscal year 2009, recreation facilities were not monitored in 2005.

Monitoring visitor use at developed recreation sites is accomplished primarily through the fee registration system. In addition, Forest employees with compliance responsibilities record use during the summer months at all fee campgrounds. On occasion, forest employees also document visitor use at non-fee developed recreation sites. Accurate visitor use information is not obtained during the shoulder seasons (before Memorial Day and after Labor Day). Permits issued for Forest Rental Cabins document the amount of visitor use at those facilities annually.

Visitor use information was collected during fiscal year 2003 through the National Visitor Use Monitoring Project (NVUM). Through a combination of traffic counts and visitor exit surveys, visitor use numbers and trends were estimated. That information, available in the Helena Supervisors Office, is the most current and accurate recreation use information available for the Helena Forest.

#### *Data Analysis Methods:*

Pikes Gulch Campground on the Helena Ranger District, established and maintained when the Forest Plan was developed, was abandoned during the 1990's due to a lack of funding. Two new developed sites were constructed at Gypsy Lake (campground and picnic area). Eight facilities have also been added to the developed recreation program as rental cabins (Cummings, Strawberry, Kading, Indian Flats, Rillway, Thompson, Bar Gulch, Eagle Guard). There has been an increase in developed recreation sites on the Helena Forest since the 1986 Forest Plan.

Previously existing developed recreation sites and new sites are now identified and tracked within the Infra database. The Pikes Gulch Campground was never listed in Infra because the site was abandoned prior to its development. Changes made at recreation sites and the associated facility conditions are monitored in Infra. Condition survey information, documented in the Infra database, is used to develop annual Operation & Maintenance Plans. That information is also utilized to identify and prioritize future capital investment projects.

#### *Monitoring Results:*

Based on condition survey information, a reconstruction project was identified and scheduled for Vigilante Campground during fiscal year 2005. Due to delays in contract preparation and award, reconstruction of Vigilante Campground was not initiated in 2005. (The Forest did not have sufficient staff to implement the project on schedule.)

Total recreation use at developed sites decreased in 2005 due to the closure of Park Lake Campground. The site was closed to public use to accomplish reconstruction of the dam. Park Lake Campground, with 22 camping units, has historically averaged an occupancy rate of approximately 44% during the main operating season.

Traffic counters were established and maintained at the Skidway and Gypsy Lake Campgrounds and the Gypsy Lake Day Use Area (all located on the Townsend District) to better determine visitor use at those specific sites.

**Skidway Campground – FY 2005**

Month	May	June	July	August	September	October
Total Vehicles		111	486	377	325	201
Average Weekend Day		14.3	17.9	13.2	14.6	7.8
Average Weekday		13.6	13.4	11.5	7.6	5.4
Remarks	No data	Partial Data				

**Gipsy Lake Campground – FY 2005**

Month	May	June	July	August	September	October
Total Vehicles		10	239	172	194	104
Average Weekend Day		No data	11.3	8.7	10	4.6
Average Weekday		3.3	4.3	3.6	3.6	2.5
Remarks	No data	Partial Data				

**Gipsy Lake Day Use – FY 2005**

Month	May	June	July	August	September	October
Total Vehicles			134	248	197	106
Average Weekend Day		No data	15.5	11.3	9.4	5.0
Average Weekday			6.9	5.9	4.4	2.6
Remarks	No data	No Data	Partial Data			

The Deep Creek Picnic Site on the Townsend District remained closed to public use as a result of the 2000 Maudlow/Toston wildfire. The district has initiated reconstruction of the picnic site and plans to open it again in 2006.

The Copper Creek Campground, located on the Lincoln District, was partially re-opened after being closed in 2004 for safety concerns following the Snow Talon fire that burned through the area in 2003. Sites near the creek remained closed to ensure flooding would not provide an unnecessary risk to visitors.

During fiscal year 2005 construction of an amphitheater located within the Aspen Grove Campground (Lincoln District) was completed. The amphitheater was used for several interpretive and education programs with average attendance of approximately 15 persons.

There were a total of eight rental cabins available during various time of the year. Rental Cabins on the Forest were occupied a total of 954 nights during calendar year 2005. This represents an increase of approximately 46% from the previous year. The popular Rillway Cabin on the Townsend District was added to the Rental Program in December 2005. Rental cabin fees were increased slightly in fiscal year 2005 to help defray increased administration costs. Cabin rental information such as the number of permits issued, number of nights occupied, number of people served, and revenues collected are documented annually and retained in the Helena Forest Supervisor's Office.

The 1986 Helena Forest Plan stated that actual use of developed recreation sites in 1981 was 84,700 RVD's. Projected use at developed sites between 1996 and 2005 was estimated to be 114,100 RVD's.

The Forest Plan indicated there were 15 developed recreation sites (campgrounds & picnic areas) on the Forest. Changes have occurred within the developed recreation program over the past 20 years. The primary change was the addition of the Rental Cabins.

The 2003 Visitor Use Monitoring Project provided a more accurate estimate of use at developed recreation sites on the Forest. NVUM use figures (identified below) also provide an average length of stay estimate.

Day Use Developed Sites: 44,000 visits  
Average Length of Stay: 1.9 hours  
Total hours at Day Use Sites = 83,600 hours  
Total RVD's at Day Use Sites = 6,966

Overnight Use Developed Sites: 33,900 visits  
Average Length of Stay: 13.4 hours  
Total hours at Overnight Sites = 454,260 hours  
Total RVD's at Overnight Sites = 37,855  
Total RVD's at Forest Developed Sites = 44,821

### Variability Measure Discussion:

#### *Variability Measures:*

Forest Plan Monitoring Requirements state that any 20% variation in visitor use between projected and actual should be documented. That task requires both projected baseline data (identified in the Forest Plan) and current recreation use information. Recreation use on National Forest lands is frequently measured by RVD's (Recreation Visitor Days). An RVD represents an aggregate total of 12 visitor hours, continuous or intermittent.

#### *Assessment:*

The 2003 total of 44,821 RVD's at Forest developed recreation sites is 39,879 less than the stated number of RVD's in 1981. Even with the addition of seven rental cabins as developed recreation sites, the amount of visitor use was much less than originally anticipated. The estimated visitor use (based on NVUM surveys) at developed recreation sites in fiscal year 2003 was only 39% of the Forest Plan projection. We believe recreation visitor use at developed sites has increased during the past 25 years. The basis for that belief is employee observation, national, regional and local recreation trends, and improved sampling methods.

Based on results of the 2003 National Visitor Use Monitoring Project, it appears the existing recreation use figures identified in the 1986 Forest Plan (based on the best available data at the time) and/or the projected future growth estimates, were high. It is unknown how original use estimates were determined and as a result, any comparison with NVUM use figures is not appropriate.

NVUM data may not provide a fully accurate picture of RVD's on the Forest either. Although it is based on a statistically valid sampling methodology, visitor use is influenced annually by weather, wildfire, economics and other factors. However, NVUM provides the most reliable recreation use information available today and is scheduled on a routine (5-year) basis. Future NVUM data, to be collected during FY 2008, will likely revise use figures on the Helena National Forest. A comparison at that time will provide a reliable analysis of the true variability of this element.

#### *Actions in response to variability assessment:*

Variability should no longer be based on the original projected use identified in the Forest Plan. Rather, future variability assessments should be compared to the 2003 NVUM estimates. However, it may not be appropriate to initiate action based on a + or - 20% variation in any single year because use figures are dependent upon factors such as: weather, fuel prices, and wildfire occurrences.

**Recommended Efforts:**

Condition surveys should continue to be accomplished at all developed sites on a five-year cycle. That information should be entered into the Infra database thereby updating deferred maintenance needs. When specific site conditions change, those changes should be reflected in the Infra database.

The Helena Forest should continue to implement the National Visitor Use Monitoring Project as scheduled, every five years. Visitor use information obtained from the 2003 survey should be utilized as baseline data for future comparisons and projections. Actual use of developed recreation sites is costly to obtain and unnecessary if NVUM information is obtained every five years. NVUM information provides the general visitor use data necessary to document and track changes in recreation use across the Forest.

Because sufficient funding is not available, developed recreation sites are not being maintained to full Meaningful Measures standards. The Forest will initiate a Recreation Site Facility Master Plan in 2006 to help establish priorities within the developed recreation program that can be funded within existing budget constraints.

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**(A2) Dispersed Recreation****Forest Plan Requirements:**

The Forest Plan requires that the spectrum of dispersed recreation opportunities and uses be monitored on a five-year interval. National Forest recreation opportunities are managed according to a Recreation Opportunity Spectrum. Recreation activities range from those managed in primitive settings (wilderness) to those managed in an urban environment (highly developed).

*Intent:*

The intent of that requirement is to ensure maintenance and enhancement of a wide variety of recreation opportunities.

**Data Sources:**

GIS coverage of the ROS; 2003 NVUM; Forest Service Infrastructure & Deferred Maintenance reporting system; Employee Observations; Public Input

Because the RIM system, formerly utilized by the Forest Service to track visitor use, was determined to be inaccurate and outdated, it is no longer utilized.

Recreation Opportunity Guides are no longer maintained by the Helena Forest. The Forest web-site now provides general information about a wide variety of recreation opportunities on the Forest.

**Current Efforts and Findings:***Documentation of monitoring methodology:*

As Forest travel planning continues, the Forest seeks and documents public comment. That input is used to develop travel plan alternatives and evaluate effects. To a large extent, the type of use and season of use allowed on Forest roads and trails determines recreation use.

Trail condition surveys are implemented as required or as needed. Condition surveys, public input, and employee observations help determine trail maintenance needs and priorities.

***Monitoring Activity:***

The Recreation Opportunity Spectrum (ROS) provides an established framework for stratifying and defining classes of outdoor recreation environments, activities and experiences. ROS is not a land classification system but rather a management objective (a way to describe and provide a variety of recreation opportunities).

The primary management activity that influenced the Recreation Opportunity Spectrum in 2005 was the North Big Belts Travel Plan decision. Through that decision, motorized use was authorized on specific roads and trails designated as part of the Forest Transportation System.

Monitoring of dispersed recreation sites was accomplished through condition survey assessments. Over a five-year period condition surveys were completed for documented dispersed sites identified in the General Forest Areas (GFA's). The resulting information was then entered into the Infra database.

Visitor use information obtained during fiscal year 2003, through the National Visitor Use Monitoring Project, provides our best estimate of dispersed recreation use. Although the recreation survey does not provide information for specific sites, it does estimate visitor use on all Helena Forest lands for a variety of recreation activities. Based on the recreation survey, the top five most popular activities on the Helena National Forest in 2003 were: viewing wildlife, hiking/walking, viewing natural features, relaxing, and driving for pleasure which are all dispersed recreation activities.

As a routine element of program management, proposed recreation actions and activities are evaluated in compliance with the National Environmental Policy Act. Specialist input is provided for all proposed projects to evaluate and document the potential impacts upon recreational opportunities and use.

***Data Analysis Methods:***

Recreation use information obtained through the National Visitor Use Monitoring Project does not provide specific use figures for any one area of the Forest. The report does provide information that indicates people use the Helena National Forest for a variety of dispersed recreation activities. However, the survey information, along with traffic counts, is a helpful tool for future recreation planning. Traffic counts, from randomly selected survey exit locations on the Forest, provide a snapshot of recreation use occurring in a specific area. Public comments provided during the survey indicate an average or better satisfaction rating for recreation on the Forest. NVUM information will be used to evaluate future recreation opportunities on the Forest.

***Monitoring Results:***

<b>ROS Category</b>	<b>Acres - as Projected in Forest Plan</b>	<b>25% Variation</b>	<b>Acres – as Identified in Eastside Assessment</b>
Primitive	105,000	78,750 – 131,250	98,214
Semi-Primitive Non-Motorized	275,000	206,250 – 343,750	193,925
Semi-Primitive Motorized	188,000	141,000 – 235,000	168,578
Roaded Natural & Modified and Rural	408,000	306,000 – 510,000	503,157

A post and pole corral was constructed at the trailhead for Trail #112 with volunteer labor provided by the Rocky Mountain Elk Foundation. This was accomplished in response to the high amount of horse based recreation activity that occurs at this site.

In 2005 National Forest lands located adjacent to Park Lake were closed to public use while the dam was being reconstructed. Several areas along the lakeshore were extremely popular for recreation activities such as: camping, picnicking, fishing, hiking, and relaxation. Past observations showed that the amount of recreation use along the lakeshore routinely exceeded use within Park Lake Campground.

Dispersed camping in the Copper Creek drainage during the fall hunting season was restricted due to safety concerns (potential flooding) associated with the Snow Talon Fire. This camping restriction resulted in reduced visitor use.

### Variability Measure Discussion:

#### *Variability Measures:*

Forest Plan Monitoring Requirements state that a 25% variation in the projected base by ROS type should be documented. The table above provides the projected summer ROS acreage by category (as identified in the Forest Plan) and the 2000 ROS acreage as identified for the Eastside Analysis Assessment.

#### *Assessment:*

Three of the four ROS classifications are currently within the range of variation as identified above. The semi-primitive non-motorized areas on the Forest are not within the 25% variation, according to the Eastside Assessment. 1986 ROS classifications were not entirely consistent with current ROS mapping classifications. To a large extent, that may account for the disparity between ROS acreage figures. Management activities impacting the semi-primitive non-motorized ROS category, such as the miles of road construction and changes in the status of Inventoried Roadless acres, were actually less than what was projected in the Forest Plan.

One primary criteria impacting ROS classifications on the Forest is the presence of motorized roads and trails. Travel plan decisions in the Clancy-Unionville and North Big Belt Mountains did impact the ROS acreage on the Forest. Although new ROS mapping efforts have not been initiated since those travel decisions, it is evident there will be an increase in the number of semi-primitive non-motorized acres. That increase may lift the ROS semi-primitive non-motorized category into the established range of 25% variation.

#### *Actions in response to variability assessment:*

Once Forest travel planning has been completed, new ROS maps will reflect the mix of available recreation opportunities. When the Forest Plan is revised, document new ROS acreages and identify acceptable monitoring variations.

### Recommended Efforts:

Dispersed recreation site information should be noted and documented in the Infra database as needed. This information is helpful in identifying resource concerns and work priorities. Utilize GFA (General Forest Areas) condition surveys to identify deferred maintenance needs and the annual program of work.

When Forest travel planning has been completed in 2009, revise ROS mapping to determine the variation in acres from that originally identified in the Forest Plan. At that time it would be appropriate to establish a new ROS baseline for the Forest. If personnel are available and funding allows, new ROS maps could be developed in 2008 for the Elkhorn and Big Belt Mountains.

Visitor use information (NVUM) was collected during fiscal year 2003 to identify visitor use numbers and trends. That information, available in the Helena Supervisors Office, is the most current and accurate recreation use information available for the Helena Forest. Base future recreation plans, in part, on information obtained through the National Visitor Use Monitoring Project. Ensure recreation facilities and programs are managed in accordance with Recreation Opportunity Spectrum objectives. Note changes in percent of recreation activity participation after implementing the next National Visitor Use Monitoring survey scheduled for fiscal year 2008. The change in recreation activities may reflect a change in trends either locally or regionally.

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### **(A3) ORV compliance and damage**

#### **Forest Plan Requirements:**

The Forest Plan requires that ORV (OHV) damage and compliance be documented.

#### *Intent:*

The intent of that requirement is to ensure travel plan updates are realistic, understandable, and enforceable. It also ensures that travel plans adequately protect the resources and meet assigned prescriptions of the Forest Plan.

#### **Data Sources:**

LEIMARS (incident reporting and case tracking system); Monitoring Reports; Employee Observations; Hunter Patrol Notes

#### **Current Efforts and Findings:**

#### *Documentation of monitoring methodology:*

All law enforcement incidents (warnings and violation notices) are documented annually. Through LEIMARS, each incident is recorded in reference to a specific 36 CFR (Code of Federal Regulations).

Field observations, trail conditions, OHV violations, and public comments regarding OHV use are documented at each Ranger District.

#### *Monitoring Activity:*

OHV violations occur in several areas of the Helena Forest. However, there were two areas where OHV violations were specifically noted during fiscal year 2005. A monitoring report from Forest employee Sue Farley (completed at the end of the big game hunting season) indicated there continue to be OHV violations in the Clancy-Unionville area. Hunter patrols also identified OHV problems in the North Big Belts.

In May, 2005 a travel plan decision was made for National Forest lands in the North Big Belts. Due to the new travel restrictions, the Forest placed a higher emphasis on monitoring OHV use during the fall big game hunting season.

An ATV recreation event on the Lincoln Ranger District in late May of 2005 involved a total of almost 300 participants. This event was monitored to ensure compliance with terms of the special use permit.

Snowmobile use declined from previous years due to low snow levels and salvage sale activities within the Copper Creek drainage. Part of the area was closed to snowmobiling to ensure public safety while

logging was underway. The local snowmobile club did not install or maintain traffic counters as they had in previous years. There were two reports of snowmobile incursions within the Scapegoat Wilderness but none were documented.

*Data Analysis Methods:*

OHV compliance and damage are monitored and evaluated continuously based on public comment and employee observation. Past, current and future travel planning responds to both compliance problems and resource concerns.

*Monitoring Results:*

Existing OHV use does impact natural and cultural resources on the Forest, although the severity of damage is highly subjective and difficult to quantify. Resource impacts resulting from OHV use have diminished since July 1, 2001 when off-route motorized travel was prohibited based on a 3-State OHV Record of Decision. Although motorized travel is only allowed on existing routes, violations occur that result in property/resource damage and/or user conflicts. Continued off-route motorized travel results from the growing popularity of OHV use and the reduced opportunities on public land. The reduction in OHV opportunities is directly related to an increase in motorized restrictions. Motorized sport riding results in some limited impacts to designated Forest trails.

During the 2005 big game hunting season, an effort was made to limit violation notices issued for new travel restrictions in the North Big Belts. It was decided to place a greater initial emphasis on education rather than enforcement.

Observations by Forest employees on the Lincoln District suggest a general increase in OHV use in 2005, specifically during the spring, summer and fall. The Keep Cool Lakes and Reservoir Lake areas were both closed with an emergency order to protect riparian areas. That action was necessary based on precipitation levels, trail conditions, and noted OHV use that was causing damage.

An ATV recreation event in late May of 2005 involved a total of almost 300 participants. Although the event was conducted primarily on designated roads and trails, the large number of OHV users caused soil displacement and vegetative damage.

Law enforcement statistics indicate that documented OHV problems on the Helena Forest declined during fiscal year 2005. There were 3 Violation Notices issued for OHV related incidents in 2005 compared with 18 the previous year. There were 42 Incident/Warning Reports documented for OHV related incidents in 2005 compared with 66 the previous year. The noted decrease could be a result of several factors including the increased presence of Forest officers in the field during the big game hunting season.

Although fewer in number, OHV problems that occurred in 2005 were similar to those occurring in the past. The primary OHV violation identified on the Helena Forest was: possessing or using a vehicle off National Forest System roads (36 CFR 261.56).

A growing problem on the Helena Forest is the illegal use of OHV's that occurs near subdivisions and other private lands, as evidenced by employee observations. The growing development and occupancy of private in-holdings suggest that this trend will continue. It is extremely difficult to monitor OHV use along National Forest boundaries where public and agency access is limited.

Gates for seasonal road closures associated with the North Big Belts travel plan decision were installed along the Ridge Road #4161 and the Long Gulch Road #8971. Many travel restriction and road signs in the Magpie, Hellgate, Little Hellgate, Avalanche, Wagner Gulch and Whites Pass areas were installed. In

October of 2005 a physical barrier was installed on the Jimmy's Gulch Road (at the Forest boundary). This was initiated because ATVs had been violating an existing closure by driving around the gate.

Illegal ATV use (off-route travel) was reported in the area near the Stove Camp trailhead on the Townsend District.

The primary methods used to track OHV impacts has been law enforcement reports, employee monitoring, and public input.

A travel plan decision for the North Big Belts was signed on May 18, 2005. The associated environmental impact statement did address OHV impacts and provided rationale for changes and additional travel restrictions. The North Big Belts travel decision was made with the following intent:

- 1) To provide a variety of motorized and non-motorized routes for both public and administrative needs that will prevent or reduce potential unacceptable damage from roads and trails to the area's resources.
- 2) To develop travel maps and respective area signing that are clear and understandable.
- 3) To provide a travel plan that is enforceable
- 4) To reduce long-term maintenance costs for the area's transportation system.
- 5) To improve watershed conditions associated with travel routes.

#### **Variability Measure Discussion:**

##### *Variability Measures:*

Forest Plan Monitoring requirements state there should be District or ID Team review to note unacceptable resource damage from OHV use or unenforceable situations.

##### *Assessment:*

Through travel plan analysis, user conflicts and resource impacts are identified. Updated travel plan decisions and implementation of site specific Closure Orders address and correct critical OHV problems. Completion of travel planning on the Forest should reduce OHV violations and the associated resource impacts. However, revision of the Forest travel restrictions and development of new motorized vehicle use maps will not totally eliminate OHV violations. Because there is a growing demand for OHV travel and frustration on the part of OHV enthusiasts regarding the lack of opportunities, some recreationists may continue to violate travel regulations.

##### *Actions in response to variability assessment:*

The implementation of new travel restrictions on the Forest will require an initial emphasis on compliance and monitoring. A Forest employee should be given responsibilities to track travel plan implementation: its progress and success. If social or resource conflicts develop following implementation of the new travel restrictions, additional management actions may be required.

#### **Recommended Efforts:**

In an effort to reduce OHV violations and impacts, travel planning should be completed on the Forest by 2009. Following travel plan revision, the Forest should develop and update (as needed) a Motorized Vehicle Use Map (MVUM) to meet the Travel Management Rule. The Forest should emphasize implementation of new travel plan decisions with improved signing and increased field presence to ensure compliance.

An increased emphasis should be made by Forest employees to monitor, document and track OHV violations, user conflicts and resource damage. Forest Service law enforcement officers should continue to coordinate with district personnel to identify all OHV problems encountered.

Forest Service personnel should limit their OHV use in areas closed to motorized travel to that deemed absolutely necessary. The public has repeatedly stated the agency should abide by existing motorized restrictions. Agency employees should not be authorized to drive on roads closed to motorized use when other options are available. When off-route motorized travel is required by Forest employees, they should ensure the public is adequately informed and impacts are limited.

Revised travel restrictions may reduce the need for a Forest ID Team to review and evaluate unacceptable resource damage resulting from OHV use. While it may be desirable to have an ID Team review and evaluate OHV impacts, individual resource specialists are capable of determining acceptable levels of motorized impacts. In addition, Line Officers have the authority to address resource damage through closure orders as they determine the need. Additional motorized closures should be implemented, based on documented need, to correct unacceptable impacts. We recommend the annual Monitoring Report continue to track OHV issues, compliance and damage.

Continue to implement Emergency Orders restricting motorized travel on specific roads or trails where resource impacts are deemed unacceptable.

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#### **(A4) Measure change in status of roadless acres**

##### **Forest Plan Requirements:**

The Forest Plan requires measuring the amount of change in the status of Inventoried Roadless acres.

##### *Intent:*

The intent of that requirement is to compare the acres and distribution of the Inventoried Roadless resource with that projected in the Forest Plan. Data sources could include the following: project plans, NEPA documents, watershed analysis, and transportation analysis.

##### **Data Sources:**

Resource project decisions; Travel Plan decisions

##### **Current Efforts and Findings:**

##### *Documentation of monitoring methodology:*

Not applicable.

##### *Monitoring Activities:*

Forest projects that may affect Inventoried Roadless resources are evaluated in compliance with NEPA regulations.

##### *Data Analysis Methods:*

Summarization of data records from project or travel plan decisions.

##### *Monitoring Results:*

No decisions were made or implemented in 2005 that resulted in modifications to Inventoried Roadless lands. The North Big Belts travel decision will slightly enhance roadless characteristics through the

reduction of 54 miles of existing motorized routes within those Inventoried Roadless Areas. The 1986 Forest Plan identified a total of 369,000 acres of Inventoried Roadless areas.

#### Variability Measure Discussion:

##### *Variability Measures:*

Forest Plan Monitoring requirements state that a loss of more than 20,000 acres by 1991 requires analysis and review of the trend. Although the length of time required to monitor this element has terminated, the Forest will continue to track and monitor changes to Forest Inventoried Roadless resources.

##### *Assessment:*

No decisions were made or implemented in 2005 that resulted in modifications to Inventoried Roadless lands. This is within the 20,000 acre variation identified within established Forest Plan Monitoring guidelines.

##### *Actions in response to variability assessment:*

No actions are needed to respond to this element.

#### Recommended Efforts:

Continue to monitor changes to national policy and management direction for Inventoried Roadless Areas. Continue to track changes to and effects upon local Inventoried Roadless Areas through environmental analysis of project proposals.

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### (B1) Wilderness

#### Forest Plan Requirements:

The Forest Plan requires the following items are monitored annually: trail conditions, visitor encounters, range conditions, trend and actual use levels, and campsite impacts.

##### *Intent:*

The intent is to provide the public high levels of wilderness recreation experiences and maintain high quality wilderness resources.

#### Data Sources:

Hunter Patrol Reports; Anecdotal Information from District Personnel; Trailhead Registration (voluntary); Limits of Acceptable Change (LAC) Information for the Scapegoat

#### Current Efforts and Findings:

##### *Documentation of monitoring methodology:*

During 2005, conditions were monitored and documented in the Scapegoat Wilderness (by Forest employees) in accordance with the Forest Plan and Bob Marshall Great Bear Scapegoat Wilderness Management Plan. Conditions within the Gates of the Mountains Wilderness Plan were minimally monitored by district trail crews.

##### *Monitoring Activity:*

NVUM survey information obtained in 2003 was insufficient to provide accurate use estimates for the Scapegoat and Gates of the Mountains Wilderness areas. There weren't enough visitor survey days assigned in NVUM for a statistically valid sample of wilderness use. Informal observations by Forest employees indicate that visitor use within both wilderness areas remained static from previous years.

### Gates of the Mountains

The Helena Ranger District's trail crew and Back Country Horsemen cleared all 52.3 miles of trail located within the Gates of the Mountains Wilderness. All trailhead bulletin boards were updated with new posters and current visitor information.

### Scapegoat

The wilderness ranger and trail crew foremen monitored conditions on approximately 70 miles of trails within the Scapegoat Wilderness. Trail crews cleared an average of 44 trees per mile on system trails. The largest accumulation of downfall was located on trails within the 1988 Canyon Creek fire area. There are approximately 110 miles of system trail in the Scapegoat administered by the Lincoln Ranger District.

Campsite inventories were completed on 43 sites in the Scapegoat during 2005 using the Limits of Acceptable Change (LAC) protocol (Revision 3, April 2003 form). Three new campsites were noted and inventoried. Preseason and operating season inspections (following LAC protocols) were completed on all outfitter camps in operation during in 2005. The outfitter base camps, spike camps, and drop camps were also visited during their operational periods and inspections were conducted.

Visitor encounters were primarily documented during fall hunter patrols. Approximately 75 miles of patrol were completed in 5 days, resulting in 28 camp contacts and 20 trail contacts. A total of 50 person days were spent in the wilderness in fiscal year 2005 patrolling, clearing trail, visiting camps, and conducting LAC inventories.

The wilderness ranger and trail crew foreman collects all LAC data and it is stored for the entire Bob Marshall Wilderness Complex out of the Lewis & Clark National Forest.

### ***Data Analysis Methods:***

Previously obtained condition surveys for trails within both the Scapegoat and Gates of The Mountains Wilderness indicate many trails are not fully maintained to Forest Service standards. The greatest level of visitor use occurs within both Wilderness areas during the fall big game hunting seasons; however, the Scapegoat Wilderness is also a popular destination during the summer.

### ***Monitoring Results:***

#### Trail conditions

Condition surveys for wilderness trails are completed as assigned or needed and documented within the Infra database. Most of the trails within the Gates are maintained annually. The HNF FP monitoring requirement for measurement and frequency of Wilderness (B1) is annual, 25% of heavy use areas and trails.

The Gates of the Mountains does not receive heavy use except during the big game hunting season. The bulk of the hunting activity is day use only. Because there are no heavy use campsites or trails, the Gates is not monitored to the same scrutiny as the Scapegoat.

In the Scapegoat Wilderness, Opportunity Class IV trails are managed to accommodate heavy traffic and there are approximately 17 miles of trail in OC IV. In fiscal year 2005, 100% (17 miles) of these trails were cleared to standard, and 70% (12 miles) of these trails were maintained to standard.

### Visitor encounters

#### Gates of the Mountains

There is little or no evidence that visitor encounters exceed existing ROS standards for primitive and semi-primitive non-motorized areas. Based on input provided by Forest employees, there are seldom more than 15 encounters per day at even the most popular areas within the Gates of the Mountains Wilderness. The current number of daily encounters (6-15) fits within the social setting criteria for a Semi-Primitive Non-motorized area.

#### Scapegoat Wilderness

Visitor encounters were primarily documented during fall hunter patrols. Approximately 75 miles of patrol were completed in 5 days, resulting in 28 camp contacts and 20 trail contacts. Noted violations include: four warnings and one citation issued for Food Storage violations; one camp was in violation of the Occupancy and Use order. A total of 50 person days were spent in the wilderness in fiscal year 2005 patrolling, clearing trail, visiting camps and conducting LAC inventories. The probabilities of encounters and general level of encounters were within standard for all four Opportunity Classes in fiscal year 2005. The amount of person days and miles of patrol were less than the previous year due to staffing priorities being shifted to national incidents during the fall hunting season. Visitor encounters fall within the 20% deviation from the Management Plan.

### Range conditions

The Moors Mountain Grazing Allotment in the Gates of the Mountains Wilderness may be grazed two of every three years. The overall range condition within the Gates of the Mountains Wilderness was monitored and documented in 2004. Although the upper Porcupine Creek drainage was utilized at 40%, the overall allotment was utilized at 20% and considered to be in good condition. There was no grazing activity on the Allotment in 2005. The overall range condition meets standards previously established within the Allotment Plan.

Because there are no grazing allotments within the Helena portion of the Scapegoat, the range condition is measured by pack and saddle stock use. Popular stock areas are managed to ensure that forage utilization does not exceed a moderately grazed appearance, and all horse and stock users are encouraged to plan for the fewest number of animals required for each trip. At individual campsites, range conditions are incorporated into condition class results.

### Trend and actual use levels

Based solely upon Forest employee observations, it appears use within the Gates of the Mountains Wilderness has remained relatively stable during the past 20 years. Because the wilderness has no lakes and very little water of any kind, it's not a popular destination for visitors. The highest level of use occurs during the fall big game rifle season. Use levels are certainly appropriate and do not generally affect the recreation experience of visitors or adversely impact wilderness resources.

Trend and actual use levels in the Scapegoat are best evaluated using the visitor encounters and campsite impacts measurements from the Limits of Acceptable Change/Opportunity Class guidelines. Please see monitoring results for those two items.

### Campsite impacts

#### Gates of the Mountains

The most popular campsites within the Gates of the Mountains are traditional hunting camps. Forest employees monitor those dispersed campsites, but not through a formal LAC process. Thus far, no single dispersed site within the Gates of the Mountains Wilderness has been identified for camping restrictions.

## Scapegoat

There are a total of 12 heavily impacted sites, eight of which (66%) were inventoried within the Scapegoat during 2005. Based on employee monitoring, campsite impacts (vegetative damage, soil compaction, litter, human waste, grazing, etc.) and trends for the Scapegoat Wilderness are summarized below by geographic area:

Bighorn Lake, Valley of the Moon, CDT (Geo unit 5-1-1): General trend is a decrease in impacts. Bighorn Lake has seen recovery of three formerly impacted sites (of five total). Valley of the Moon had eight sites with heavy impacts in 2004 but only four of those sites still showed a heavy impact in 2005. It should be noted, those four sites are documented as having very heavy impact and regular use.

Middle Fork, Upper Lander's Fork (Geo unit 5-2-1): General trend is a slight decrease in impacts. This drainage receives a lot of regular use and there are three moderate to heavy sites in the Middle Fork, down two sites from 2004. Three moderately to heavily impacted sites are documented here, the same numbers as in 2004.

Mainline Trail, Twin Lakes, North Fork Meadow Lake (Geo unit 5-3-1): General trend is a decrease to static impacts. The decrease has occurred mostly in the Twin Lakes area due to a loss of several sites because of blown down trees. There are a few sites off the Mainline Trail that see regular use all season and are heavily impacted.

West side, Mineral Creek (Geo unit 5-4-1): General trend is static. The main impacts are a cluster of sites on the East Fork in the lower end of the Mineral drainage. They are moderate to heavy impact.

Meadow Lake, East Fork of Meadow Creek (Geo unit 5-5-1): General trends show a slight increase in impacts. The peninsula/shoreline of Meadow Lake has three heavily impacted sites located within a small area. This area is currently out of standard for the opportunity class and the Forest is looking into potential management actions such as a livestock restriction and campsite rehab. At the East Fork, there are two sites (out of four) with a moderate impact rating.

Alpine parks, Arrastra and Dry Creeks (Geo unit 5-5-2): General trend is a slight increase in impacts. Fiscal year 2005 shows no decrease in moderately impacted sites (3), or highly impacted sites (1) and two additional sites are at risk of increased impacts if use levels continue.

Webb Lake, Parker Lake, Sourdough (Geo unit 5-6-1): General trend is static but there is a noted decrease in impact and substantial recovery at the seven sites at Parker Lake.

Heart Lake, Landers Fork (Geo unit 5-7-1): General trend of impact is static. There are nine moderate to heavy impacted sites at Heart Lake in 2005 (13 in 2004). The peninsula shows recovery due to a long-standing closure but the main campsites are deteriorating. There is a high density of heavily impacted sites that are out of standard in opportunity class IV. Active management should be considered.

### Variability Measure Discussion:

#### *Variability Measures:*

Forest Plan Monitoring requirements state that a 20% deviation from management plans for all portions of this element is acceptable.

Trail conditions

## Gates of the Mountains

There are no specific maintenance requirements established for trails in the Gates of the Mountains Wilderness. Primary management direction includes: complete routine trail maintenance and update trail condition surveys.

## Scapegoat

Trail Conditions for the Scapegoat (Reference MA P-1 of HNF FP, BMWC Recreation Management Direction).

Opportunity Class I – primary objective of maintenance is for resource protection. Monitored annually when workloads allow.

Opportunity Class II – primary objective of maintenance is for resource protection. Monitored annually when workloads allow.

Opportunity Class III – primary objective of maintenance is for resource protection, cleared to standard. Monitored annually when workloads allow.

Opportunity Class IV – primary objective of maintenance is for resource protection. Managed to accommodate heavy traffic (cleared to standard to withstand heavy traffic). Monitored annually. HNF FP monitoring requirement for measurement and frequency of Wilderness (B1) is annual, 25% of heavy use areas and trails.

Visitor encounters

## Gates of the Mountains

Because visitor use was limited, the appropriate number of trail encounters was never established for the Gates of the Mountains Wilderness. It can be assumed however the number of encounters would generally meet established ROS criteria for primitive and semi-primitive areas (less than 15 encounters daily). The wilderness implementation schedule for the Gates does recommend that baseline data be gathered to establish a useable carrying capacity.

## Scapegoat Wilderness

Visitor Encounters for the Scapegoat (Reference MA P-1 of HNF FP, BMWC Recreation Management Direction). As a minimum, trail and campsite encounters in Opportunity Classes III and IV will be monitored annually.

Opportunity Class I – general level of encounters is very infrequent.

Opportunity Class II – general level of encounters is low.

Opportunity Class III – general level of encounters is moderate.

Opportunity Class IV – general level of encounters is moderate to high.

### Range Conditions

There is 1 existing grazing allotment authorized within the Gates of the Mountains Wilderness (Moors Mountain). The Moors Mountain grazing allotment, located within the Gates of the Mountains, was rested in 2005.

The range condition in the Scapegoat is measured as grazing use by pack and saddle stock, as there are no livestock grazing permits in this wilderness. These areas are managed to ensure that forage utilization does not exceed a moderately grazed appearance, and all horse and packstock users are encouraged to plan for the fewest number of animals required for each trip. At campsites, the range condition is incorporated into condition class results.

### Trend and actual use levels

The management plan for the Gates does require monitoring recreation use via ranger observations. It also states baseline data must be gathered to establish useable carrying capacity.

Trend and actual use levels in the Scapegoat are best evaluated using the visitor encounters and campsite impacts measurements from the Limits of Acceptable Change/Opportunity Class guidelines.

### Campsite impacts

The management plan for the Gates states, "minimize person-caused change to the wilderness character due to fire suppression and recreational activity by adopting the limits of acceptable change (LAC) concept. Hunter patrols during the 2005 big game hunting season did not identify any new campsites in the Gates of the Mountains Wilderness.

Campsite impacts within the Scapegoat are monitored and evaluated following the established Limits of Acceptable Change/Opportunity Class guidelines.

### ***Assessment:***

The primary intent of the wilderness element within the Forest Plan Monitoring requirements is to achieve a high level of wilderness recreation experience and to maintain a high quality wilderness resource. Current management and use of both the Gates of the Mountains and Scapegoat Wilderness does meet that intent. Special orders have been implemented to limit both social and resource impact. Restrictions for the wilderness apply to the following: mechanized and motorized equipment, food storage, camping, number of stock, and number of persons in one group.

### ***Actions in response to variability assessment:***

Social and resource conditions should continue to be monitored and documented within both the Scapegoat and Gates of the Mountains Wilderness areas. A minimum set of Forest Plan standards should be established within the Gates to monitor wilderness degradation.

### **Recommended Efforts:**

Trail condition surveys should be accomplished within the Gates and Scapegoat when assigned or as needed. Field inspections on 25% of the heavy use trails should still occur and be documented annually to identify critical maintenance needs and develop a out-year program of work.

The majority of frequently used campsites in the Scapegoat and Gates of the Mountains Wilderness have been mapped and documented in the past. Annually, 25% of the wilderness campsites should be monitored and documented to ensure resources aren't degraded.

Every effort should be made to ensure both the Scapegoat and Gates of the Mountains Wilderness Areas are managed to meet the 10-Year Wilderness Challenge. Within funding limitations, the Forest must determine which elements are of the highest priority for implementation.

Employee visits within the Gates of the Mountains Wilderness occur primarily on weekdays and do not provide insight into visitor use on weekends and holidays. The Forest should consider gathering baseline data that could be used for the establishment of carrying capacity.

Convene an ID team to recommend a management plan for the Heart Lake area in the Scapegoat Wilderness.

The Forest Wilderness Program Leader should be designated responsibility for coordinating wilderness monitoring in both the Scapegoat and Gates of the Mountains. That individual should also assume responsibility for addressing resource element B-1 in the annual Forest Monitoring Report.

#### Other Monitoring Efforts:

In 2004 the USDA Forest Service initiated a 10-Year Wilderness Stewardship Challenge to help define successful wilderness stewardship. Within 10 years, each nationally designated wilderness should be managed in accordance with at least six of the ten following standards.

Element #1 – Wilderness is covered by a fire plan that evaluates and considers the full range of management responses.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #2 – Wilderness is successfully treated for noxious weeds/invasive plants.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #3 – Monitoring of wilderness air quality values is conducted and a baseline is established for this wilderness.

Scapegoat – meeting the BFES standard

Gates of the Mountains - meeting the BFES standard

Element #4 – Priority actions identified in a wilderness education plans are implemented.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #5 – This wilderness has adequate recreation standards, monitoring and management programs to monitor opportunities for solitude or primitive and unconfined recreation.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #6 – Wilderness completed recreation site inventory.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #7 – Outfitter and guide permits have operating plans which direct outfitters to model appropriate wilderness practices and incorporate appreciation for wilderness values in their interaction with clients.

Scapegoat – meeting the BFES standard

Gates of the Mountains – meeting the BFES standard

Element #8 – Wilderness has a minimum set of forest plan standards in place which monitor degradation of the wilderness resource.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #9 – The priority information needs for wilderness have been addressed through field data collection, storage, and analysis.

Scapegoat – not meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #10 – Baseline workforce is in place.

Scapegoat – not meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

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## **(C1-C9) Wildlife**

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### **(C1) Ungulate distribution, movement, population structure and density. (Elkhorns)**

#### **Forest Plan Requirements:**

Seasonal distribution, movement patterns, population structure and density of elk, mule deer, moose, and mountain goat populations are to be monitored to identify ungulate population segments and year long range of each segment in the Elkhorns. This monitoring element applies to Management Areas E1 – E4.

#### *Intent:*

Identify ungulate population segments and year long range of each segment in the Elkhorns

#### **Data Sources:**

Ground and aerial observations; radio tracking; annual Elkhorn wildlife monitoring report (Forest Plan suggested data sources). Specifically, data are derived from annual aerial surveys conducted by Montana Department Fish, Wildlife, and Parks (MTFWP) personnel. Data are filed at the Supervisor's Office and include:

- Elk surveys in Hunting District 380 for winter 2004 and 2005
- Mule deer surveys in Hunting District 380 for winter 2004, 2005, and spring 2005
- Mountain goat surveys in Hunting District 380 1999

MTFWP is responsible for determining methods to measure populations. Currently, no radio-tracking is occurring. There is no Elkhorn wildlife monitoring report. Monitoring conducted in the Elkhorns is reflected in the Forest-wide annual monitoring reports.

## Current Efforts and Findings:

### *Documentation of Monitoring Methodology:*

Aerial surveys are utilized by MTFWP personnel, annually, to develop trend data to determine if the population under consideration is within the population goals as described in species-specific management plans. Subsequently, these data are used to establish amount of type of hunting permits for the following year. See MTFWP Memos in project file for more details on methodology.

### *Monitoring Activity:*

#### Elk:

Aerial surveys were conducted on February 25<sup>th</sup> and 26<sup>th</sup>, 2005 for elk.

#### Mule Deer:

Aerial surveys were conducted on January 5<sup>th</sup> and April 16<sup>th</sup>, 2005 for mule deer.

#### Mountain Goats:

Aerial surveys were last conducted on September 13<sup>th</sup>, 1999, for mountain goats.

### *Data Analysis Methods:*

Other than general observation summaries, no data analyses are conducted for this element.

### *Monitoring Results:*

#### Elk:

A total of 1,745 elk were observed in 2005 (See Table, below) which is a decrease of 66 elk (N=1811) over last year's survey. The population objective for this Elk Management Unit (EMU) was revised in 2005 and is now a range (1,700-2,300) of **observed** elk. Calves were classified from the air this year with an observed ratio of 26 calves: 100 cows. Calf ratios observed on winter range in this district typically range from 35 to 45 calves: 100 cows. The lower calf ratios are probably a result of continued drought, which affects the physical condition of the cows and their ability to carry a fetus to term or sustain a calf once born. Most herd units were stable compared to last year except for the Prickly Pear herd segment, which saw an increase of 256 elk compared to last year. With the lack of snow cover on some winter ranges, this increase may reflect a shift in distribution from other herd segments, particularly the Devil's Fence herd segment where we only saw a total of 14 elk this winter.

A total of 123 bulls were observed of which 66 were yearling bulls and 57 bulls 2 1/2 years old or older. Overall, bull elk made up 7.1% of the total elk counted. Again, this ratio is probably lower than would be expected as some bulls may have been missed during the survey. The objective in the EMU is to have 10% of the elk population comprised of antlered bulls.

**Summary of elk observations in Hunting District 380 for 2004 and 2005**

Herd Segment	Total		Cows		Calves		Yearling Bulls		Brow-tined Bulls		Total Bulls		Unclassified	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
South Crow	439	350	344	274	68	71	6	4	21	1	27	5	0	0
North Crow	348	244	249	171	54	47	9	13	36	15	45	28	0	0
Kimber	422	439	313	350	75	81	10	7	24	1	34	8	0	0

Summary of elk observations in Hunting District 380 for 2004 and 2005														
Herd Segment	Total		Cows		Calves		Yearling Bulls		Brow-tined Bulls		Total Bulls		Unclassified	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
Sheep Creek	209	195	171	146	27	36	4	11	7	2	11	13	0	0
Prickly Pear	137	393	111	285	26	81	0	24	0	3	0	27	0	0
Elkhorn	89	60	65	--	16	--	7	3	1	18	8	21	0	39
Devil's Fence	147	14	61	0	13	0	9	3	64	11	73	14	0	0
Spokane Hills	20	50	20	32	0	11	0	1	0	11	0	12	0	0
Total	1811	1745	1334	1258	279	327	45	66	153	57	198	123	0	39

Mule Deer:

A total of 786 deer were observed during the winter aerial survey (See Table, below). This was an increase of 318 deer over last year. This major increase in numbers was largely due to a couple of weeks of below normal temperatures and fairly good snow cover causing deer to concentrate more than usual on traditional winter ranges. Aerial surveys were conducted again during the spring with a total of 233 deer observed. This is below the 9-year average of 320 (See data in project file). This could be the result of warm weather that may have resulted in deer dispersing off of winter range earlier than normal. Also, Special Forces Units of the National Guard were training in the vicinity of the Limestone Hills. Deer may have been disturbed due to load explosions associated with this activity.

Fawn production was similar to last year with 25.5 fawns per 100 adults in the winter and 26.9:100 during the spring. Fawn production continues to be below potential and is probably a reflection of the continued drought-like conditions of the past couple of years. The buck: doe ratio of 11.1 bucks:100 does (8.0% bucks in the population) was similar to previous years.

Summary of mule deer observations in Hunting District 380 for 2004 and 2005					
Year	Post-Season Total Deer	Fawns: 100 Adults (Post Season)	Spring Total Deer	Fawns: 100 Adults (Spring Recruitment)	Bucks: 100 Does
2005	786	25.5	233	26.9	11.1
2004	458	30.6	366	33.6	14.5

Mountain Goat:

A total of 19 goats were observed in 1999, the last year of data for mountain goats in the Elkhorns. Goat numbers have been declining since 1992 at which time 50 goats were observed (See Table, below). One possible explanation for this decline is predation by an increasing lion population. Lion tracks have been observed following goat tracks in some areas during the fall when there was snow to observe tracks.

The mountain goat hunting season was terminated in 2000 due to low numbers of goats; therefore, there are no aerial survey data after 1999 and no mountain goat data to report. Until surveys resume, subsequent monitoring reports will not include this item.

Summary of mountain goat observations in Hunting District 380 for 1972 – 1999															
Date	1972	1973	1975	1976	1977	1980	1981	1982	1992	1993	1995	1996	1997	1998	1999
Total	17	4	20	30	4	32	22	42	50	33	2	36	29	5	19

### Variability Measure Discussion:

#### *Variability Measure:*

±10% from previous measurements

#### *Assessment:*

##### Elk:

The total number of elk observed in 2005 decreased by 4% compared to 2004 but was still within the population objective of 1700 to 2300 observed elk. The cow elk composition decreased by 2% relative to total counted; cow elk comprised 74% of total observed in 2004 compared with 72% in 2005. Calves comprised 15% of the total observed in 2004 compared with 19% in 2005, an increase of 4%. Bull elk made up approximately 11% of the total observed in 2004 compared with 7% in 2005, a decrease of 4%.

Variation exists in the total number of observed elk and within each population segment between 2004 and 2005. However, the variation remains within 10% of the previous year's measurements and therefore is considered acceptable

##### Mule Deer:

Except for the post season count, all mule deer numbers are down in 2005 relative to 2004. The post season count is up approximately 72% over 2004; however, the spring count decreased by 37%. Both the post-season and spring fawn: adult ratios have decreased by 17% and 20% respectively. The buck: doe ratio has decreased by 23%.

The variation reflected in the changes between 2004 and 2005 exceed the acceptable variation of ± 10%. According to MTFWP, the variation between 2004 and 2005 in number of deer counted post-season may be the result of increased snow cover that concentrated deer on winter range. Low spring counts may reflect deer dispersing off of winter range earlier than normal. Other decreases may be the result of continued drought-like conditions. All of these possible explanations are weather related and outside the span of the Forest's control. In other words, this is not associated with a land management-oriented practice. MTFWP continues to regulate the permit system to adjust for these variations.

##### Mountain Goat:

Although the number of mountain goats observed had increased almost 4-fold in 1999 compared with 1998, numbers of goats overall had been declining in the Elkhorns.

Mountain goats are no longer hunted in the Elkhorns due to their low numbers. One possible cause of this decline – increases in lion populations – is outside the scope of the Helena National Forest, i.e. not a land management-oriented practice. However, MTFWP has discontinued their management practices of hunting in order to remedy the situation.

#### *Actions in Response to Variability Assessment:*

No actions are needed in response to the variability assessments, above, for elk, mule deer, or mountain goats either because we are within the acceptable variation or actions that would correct the variability (i.e. hunting permit structure) are not a land management oriented practice.

**Recommended Efforts:**

No recommendations at this time.

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**(C2) Ungulate habitat evaluation (Elkhorns)****Forest Plan Requirements:**

Habitat will be evaluated on the basis of topographic and physiographic features, vegetation, and climate for elk, mule deer, moose, and goat to determine habitat preferences by species of wildlife. This monitoring element applies to Management Areas E1 – E4.

*Intent:*

To determine preference by species of wildlife.

**Data Sources:**

Aerial photos, habitat type inventory, land type inventory, field transects, annual Elkhorn wildlife monitoring report (Forest Plan suggested data sources). Specifically, we utilized reports produced by Ecosystem Research Group (ERG) that look at habitat and range conditions for the North Crow and Kimber Elk Herd Units, as reported in the FY04 Monitoring Report. They are available on their website and on file in the Supervisor's Office:

([http://www.ecosystemresearchgroup.com/elkhorn\\_working\\_group.html](http://www.ecosystemresearchgroup.com/elkhorn_working_group.html)). ERG utilized aerial photos and existing inventories as part of their report. Field data were not collected as part of this phase. There is no Elkhorn wildlife monitoring report. Monitoring conducted in the Elkhorns is reflected in the Forest-wide annual monitoring reports.

**Current Efforts and Findings:**

There are no new efforts for 2005. The final phase, Phase II, is scheduled to be completed in 2006. Therefore the activity and results described below are excerpted from the FY04 Monitoring Report.

*Documentation of Monitoring Methodology:*

A detailed description of the methodologies utilized by ERG is located in the "Elkhorn Vegetation Study Final" (Phase One).

*Monitoring Activity:*

In the FY04 Monitoring Report, habitat and range conditions as analyzed by ERG were summarized. ERG conducted an independent assessment of existing vegetation and wildlife information that was available for the Elkhorns. Agency files, literature, and private and anecdotal sources were reviewed. Agency specialists, ranchers, conservationists and the public were contacted for information and data. These data will be used to determine the extent of elk/livestock interactions from which recommendations will be developed as part of the Final Report. Results from the Final Report will be summarized in the FY06 Monitoring report.

*Data Analysis Methods:*

A detailed description of the data analysis methods utilized by ERG is located in the "Elkhorn Vegetation Study Final" (Phase One).

*Monitoring Results:*

We reported in FY04 that ERG concluded in their study that "rangeland habitats in the North Crow Allotment are in acceptable condition". They also reported that forage use on both the North Crow and Kimber elk herd units (by elk and cattle) peaked in 1996 and decreased by 37% (Kimber) and 12%

(North Crow) in 2003. Production in 2004 was estimated to be about 65% of normal based on range site descriptions.

#### Variability Measure Discussion:

##### *Variability Measure:*

±10% from previous measurements

##### *Assessment:*

ERG reports that the primary agents responsible for current conditions in portions of the Elkhorns include fire suppression, noxious weed invasions, and precipitation patterns. Traditional foraging habitat has been lost as a result of these agents; however, small patches of hiding and thermal cover now occupy portions of the landscape in areas of conifer encroachment. The ERG Final Report is anticipated in 2006. Data from that study will be used to develop baseline information from which variability will be assessed in the future.

##### *Actions in Response to Variability Assessment:*

There are no actions needed at this time.

#### Recommended Efforts:

No recommendations at this time.

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### **(C3) Effects of land use activities on ungulate populations (Elkhorns)**

#### Forest Plan Requirements:

Past, present, and future land use activities and their effect on populations will be evaluated to determine responses to man imposed activities by various ungulate populations. This monitoring element applies to Management Areas E1 – E4.

##### *Intent:*

Evaluate response to man imposed activities by various ungulate populations.

#### Data Sources:

Field observations, aerial observations, radio-tracking, hunter check stations, field transects, annual Elkhorn wildlife monitoring report (Forest Plan suggested data sources). Specifically, we utilized reports produced by Ecosystem Research Group (ERG) that look at habitat and range conditions for the North Crow and Kimber Elk Herd Units, as reported in the FY04 Monitoring Report. They are available on their website and on file in the Supervisor's Office: ([http://www.ecosystemresearchgroup.com/elkhorn\\_working\\_group.html](http://www.ecosystemresearchgroup.com/elkhorn_working_group.html)).

ERG utilized aerial photos and existing inventories as part of their report. Field data were not collected as part of this phase. There is no Elkhorn wildlife monitoring report. Monitoring conducted in the Elkhorns is reflected in the Forest-wide annual monitoring reports.

#### Current Efforts and Findings:

There are no new efforts for 2005. The final phase, Phase II, is scheduled to be completed in 2006. Therefore the activity and results described below are excerpted from the FY04 Monitoring Report.

### ***Documentation of Monitoring Methodology:***

A detailed description of the methodologies utilized by ERG is located in the "Elkhorn Vegetation Study Final" (Phase One).

### ***Monitoring Activity:***

ERG, in their Phase One Elkhorns Vegetation Study, reviewed existing data to determine and analyze if there are effects of livestock grazing on elk and their habitat. Because only existing data were used, there are gaps in the data particularly relative to the current conditions. ERG also compiled elk trend data. Information on other ungulate species has been requested from Montana Fish, Wildlife, and Parks and will be used in subsequent monitoring reports.

### ***Data Analysis Methods:***

A detailed description of the data analysis methods utilized by ERG is located in the "Elkhorn Vegetation Study Final" (Phase One).

### ***Monitoring Results:***

ERG determined that changes on the landscape have occurred with respect to trends in ecological condition including conifer encroachment, and big sagebrush encroachment. Trends in ecological condition indicate that desirable<sup>1</sup> species have decreased between 1970 and 1978 while least desirable species have increased. ERG also determined that between 100 and 150 acres of grasslands have been lost between 1947 and 1995 due to conifer encroachment. Big sagebrush has become more widespread and abundant compared to historic conditions. Historically, dense patches of big sagebrush occurred in isolated patches. Between 1969 and 1978 Big sagebrush had increased by about 30%.

Elk herd unit trends indicate that elk numbers in the 1980s increased substantially to 1,304. In particular, the South and North Crow herd units saw increases in the 1980s of 125% over the previous two decades. Elk numbers peaked in 1995 and have remained between 1500 and 2000 from 1995 through 2003.

## **Variability Measure Discussion:**

### ***Variability Measure:***

±10% from previous measurements

### ***Assessment:***

ERG preliminarily concludes that the changes in species composition are due in large part to fire suppression. Changes in desirable and least desirable species as well as changes in abundance of big sagebrush may also be the result of herbivory.

Fire suppression and herbivory are two agents of change that have helped shape the landscape in the portions of the Elkhorns studied by ERG. Land use activities usually refer to active management by the Forest Service. Fire suppression typically is not considered a land use activity.

The effects of herbivory on species composition reflect both livestock and native ungulate use. Therefore, at this point in the ERG study, it's not possible to attribute these changes solely to livestock grazing, a land use activity.

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<sup>1</sup> The Forest Service defines desirables as species of undisturbed or climax plant communities or which have been intentionally seeded. They are the first to show effects of heavy grazing use. Least desirables are species usually characteristic of disturbed areas and often not native.

ERG attributes upward trends in elk numbers to management changes in hunting regulations and to decreases in cattle stocking. Precipitation may have played a role but data are inconclusive.

The ERG Final Report is anticipated in 2006. Data from that study will be used to determine whether we are within the acceptable variation for this monitoring element.

*Actions in Response to Variability Assessment:*

There are no actions needed at this time.

**Recommended Efforts:**

No recommendations at this time.

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**(C4)Elk and deer habitat suitability, indicator species**

**Forest Plan Requirements:**

Elk/mule deer habitat effectiveness (cover/forage, open road density, and livestock impacts on elk habitat potential) will be monitored to be able to respond to any unacceptable deviation from past measurements. This monitoring element is applicable to Management Areas L2, H1, H2, T2, T3, W1, W2, and E1 through E4.

*Intent:*

To be able to respond to any unacceptable deviation from past measurement.

**Data Sources:**

Project EAs, herd unit sampling, forage/browse transects (Forest Plan suggested data sources). Specifically, the following data sources were used to address this element:

- Cover and forage data based on the updated master vegetation data stored electronically at the Supervisor's Office
- Forest Service Activity Tracking System (FACTS)
- Open road densities generated from ARC coverages stored electronically at the Supervisor's Office.
- Road closure effectiveness data based on field surveys; forms are located in the Supervisor's Office.
- Habitat effectiveness observations based on field surveys
- Aerial Surveys from Montana Department Fish, Wildlife, and Parks (MTFWP). Data are filed at the Supervisor's Office and include:
  - Elk surveys in Hunting District (HD) 390, 391, and 392 for winter 2004 and 2005
  - Mountain goat surveys in Hunting District 451 for 2004 and 2005

**Current Efforts and Findings:**

Several ongoing efforts contribute to our understanding of habitat effectiveness for elk and mule deer. We discuss changes in cover over time, open road densities, the effectiveness of our road closures and habitat management activities, as well as a discussion of MTFWP aerial survey data for elk and mountain goats. We include mountain goats in the element although they are not specifically identified.

### ***Documentation of Monitoring Methodology:***

Cover and forage data are derived from vegetation data and are based on Forest Plan definitions for cover. Crown closures of 40% or greater are considered cover; all else is considered forage. Analysis algorithms are on file at the Supervisor's Office. These data, as originated for the FY04 Monitoring Report, were updated for FY05 based on the FACTS database where changes in cover due to harvest or fire are recorded.

Analysis algorithms for open road density are on file at the Supervisor's Office. Data were analyzed for all lands that fall within the Helena National Forest Boundary, including public and private. Data were analyzed according to the applicable management areas and by elk analysis areas. Open road densities Forest-wide have not changed since FY04. The data presented below are excerpted from that report.

Road closure effectiveness monitoring methodologies varied depending on the area under study. Monitoring in the Wagner-Atlanta project area was conducted according to parameters identified in the field data collection form – on file in the Supervisor's Office. Other road closure effectiveness monitoring was based on general field observations.

Habitat effectiveness monitoring was also based on general field observations.

#### ***Monitoring Activity:***

##### *Cover and Forage:*

Harvest activities in 2005 were evaluated to determine if cover and forage values reported in the FY04 Monitoring Report were affected by these activities.

##### *Open Road Densities:*

Open road densities have not changed since the FY04 Monitoring Report. We report data used in the FY04 Monitoring Report. Those data are based on road information from 2003 since there were no changes in road management in 2004 (as well as 2005).

##### *Road Closure Effectiveness:*

***Wagner Atlanta*** - Road closure effectiveness was monitored in the Wagner Atlanta Project Area. Closed roads were monitored on two dates during the hunting season to determine adequacy of closure. Type of closure was identified and whether the closure was effective in preventing motorized use (i.e. evidence of use). All roads identified for closure upon completion of the Wagner Atlanta Timber Sale were monitored. Field notes can be found in the project file.

***Divide Landscape*** - In several areas throughout the Divide landscape, roads and motor trails appear to be causing problems for elk, deer, and other big game species in terms of security habitat. Many of these routes have been systematically surveyed in recent years in order to assess the precise character of impacts on local wildlife. In 2005, monitoring efforts in the Divide landscape concentrated in two areas: the north Continental Divide and Clancy-Unionville areas.

In the north Continental Divide area, we investigated a former motor bike trail system now closed to motorized use (the Continental Divide trail north of Black Mountain and the upper Deadman Creek trail) and a newly discovered user-made motor trail system between Black Mountain and Ophir Creek.

In the Clancy-Unionville implementation area, several routes of uncertain status (in terms of motorized use) were surveyed, and the character of motorized operations and wildlife use along the routes were detailed. In all cases, information was recorded via digital photos, GPS plots, and detailed field notes.

Field notes can be found in the project file.

***Blackfoot Landscape*** - Selected roads, trails and habitat on various parts of the Lincoln District were monitored to provide additional baseline information on use patterns of elk, deer, and other big game animals. Emphasis was on changes in OHV use patterns, effectiveness of current travel restrictions, and elk and deer habitat use. Areas observed for OHV use were the Stemple Pass area, and Upper Copper Creek drainage.

***North Belts Landscape*** - A survey of roads and trails begun in 2003 was continued in 2005. Information was recorded in field notes and via digital photos keyed to maps. Proximate objectives were to detail the status of each route, discern patterns of human activity, note the nature of wildlife use, and determine what courses of action would be in the best interests of the wildlife resource. Surveys were limited to the Favorite Gulch-Devils Tower area road system. Field notes can be found in the project file.

*Habitat Effectiveness:*

***Divide Landscape*** - The Elliston Face area in the Little Blackfoot drainage was surveyed to determine elk use patterns—particularly with regard to winter thermal cover and potential forage.

Other areas monitored for elk use (primarily with regard to open road presence and hiding cover availability) were the Brooklyn Bridge, Little Corral Gulch, Black Mountain, and Mt Helena ridge areas.

Field notes can be found in the project file.

***North Belts Landscape*** - A number of proposed range improvements in the Jim Ball Basin-Elk Ridge area—most involving water developments and local fencing—were scrutinized as to potential effects on wildlife. Wildlife habitats in the Favorite Gulch region between Beaver Creek and Trout Creek were surveyed extensively in expectation of a proposed fuels treatment project. This fieldwork was a continuation of a survey effort begun in FY04.

Two areas in dry Douglas-fir and ponderosa pine habitat that have been substantially altered by wildfire (the North Hills burn of 1984) were surveyed for a variety of wildlife components—in particular, forage quality, conifer regeneration, cover characteristics, and elk use patterns. The areas examined were the Hunters Gulch-Big Log Gulch and Devils Tower areas. Both areas have been monitored in the past. The ultimate objective is to determine what sort of long-term habitat structure and productivity will follow stand replacing fires in forest habitats that historically were subjected primarily to low-intensity underburns—and what the implications for wildlife might be.

Field notes can be found in the project file.

***Blackfoot Landscape*** - Forest habitats proposed for thinning or prescribed burning were visited in the Poorman Creek drainage to determine use by big game.

*Aerial Surveys:*

MTFWP personnel conducted aerial surveys in the Big Belts to estimate trend counts for elk and mountain goats. Mule deer were not surveyed in the Big Belts in 2005.

***Data Analysis Methods:***

General observation data were summarized for a majority of the components in this discussion. No specific statistical analyses were utilized.

***Monitoring Results:******Cover and Forage:***

The following table summarizes the changes in forage and cover between FY04 and FY05. Approximately 56 acres of cover were removed as a result of harvest during FY05. These acres are now considered part of forage.

<b>Changes in cover and forage between FY04 and FY05</b>		
Year	Cover (acres)	Forage (acres)
2004	203,501	128,826
2005	203,445	128,882

***Open Road Densities:***

Open road densities as reported in the FY04 Monitoring Report were 0.8 miles/square mile. Open road densities were estimated for 1991 at 1.1 miles/square mile. The changes between 1991 and 2003 indicate a reduction in road densities of 25%. The following table summarizes changes in road density by elk analysis area.

<b>Changes in road densities by elk analysis areas between 1991 and 2003</b>			
Elk Analysis Area	1991 Open Road Density	2003 Open Road Density	Percent Change
Arrastra Creek	0.2	0.0	-23.3
Atlanta	1.0	0.9	-2.5
Battle Mountain	7.6	7.6	0.0
Beaver Creek	1.6	1.6	-3.7
Birch Creek	1.3	1.3	0.0
Black Mtn - Brooklyn Bridge	0.7	0.7	-2.0
Boulder Baldy	0.6	0.6	0.0
Cabin Creek	0.8	0.8	0.0
Confederate	1.6	1.6	0.0
Devils Fence	2.6	1.6	-101.7
Dry Range	0.5	0.5	0.0
Elk Ridge	2.0	2.0	0.0
Flesher Pass	1.2	1.2	0.0
Greenhorn	0.7	0.7	0.0
Greyson	11.1	11.1	0.0
Hedges	1.4	1.4	0.0
Hellgate	0.5	0.5	0.0
Jericho	1.5	1.5	0.0
Keep Cool	0.7	0.7	-2.6
Kimber	1.1	0.4	-63.3

Changes in road densities by elk analysis areas between 1991 and 2003			
Elk Analysis Area	1991 Open Road Density	2003 Open Road Density	Percent Change
Landers Fork	0.1	0.1	0.0
Little Blackfoot	0.3	0.3	0.0
Little Prickly Pear - Ophir	0.3	0.2	-7.7
Nevada Creek	2.3	2.3	0.0
North Crow	1.2	0.9	-32.8
North Fork	0.7	0.4	-32.5
Ogden Mtn	1.3	1.3	0.0
Poorman Creek	1.2	1.2	0.0
Prickly Pear	0.8	0.7	-5.6
Quartz	1.4	1.4	0.0
Ray Creek	0.9	0.9	0.0
Sheep Creek	1.1	0.7	-41.8
Sixmile	0.0	0.0	0.0
South Crow	1.3	0.9	-36.9
Spotted Dog	0.3	0.3	0.0
Wagner/Thomas	1.6	1.6	0.0
Whites Gulch	0.4	0.4	0.0

Road Closure Effectiveness:

**Wagner Atlanta** - Seven closed roads, comprising 16.9 miles, were scheduled to be closed upon completion of the Wagner Atlanta Timber Sale. Recipe closures included re-contouring, debris placement, signs, and gates. All of these roads were monitored at least once during November, 2004. Two of the seven roads had evidence of use.

**Divide Landscape** - The Continental Divide trail north of Black Mountain and the Deadman trail segment connecting to it from the east were closed to motorized use as part of the Sound Wood vegetation and travel management project in 1999. Compliance was sporadic initially; but the 2005 monitoring revealed no recent motorized use of these trail segments.

The illegal Black Mountain–Ophir motor trail appears to have been constructed in stages sometime after 2000. It traverses a previously non-motorized zone of excellent habitat for elk, bears, mountain lions, marten, lynx, and other key species. The route also compromises an elk security area designed to be maintained by closure gates off the Ophir Creek Road. This trail disrupts hunting season security for big game species and the integrity of otherwise unroaded linkage habitat for threatened, endangered, and sensitive species.

In the Clancy-Unionville area, some routes over the divide to the Tenmile drainage that penetrate otherwise secure elk habitat are in poor physical conditions and barely navigable, but they continue to attract ATV and 4WD use, particularly in hunting season. The “closed” route into Little Corral Gulch

meadows continues to be used by ATV's and motor bikes, though off-trail riding was little evident in 2005.

***Blackfoot Landscape*** - Open road densities have remained fairly constant over the past few years; however some changes in OHV use patterns have occurred. New user created routes have increased trail densities in some areas reducing habitat security for elk, mule deer and various other species. Unauthorized OHV use is also occurring on some seasonally restricted routes and is likely at higher levels than in the past due to the overall increase in OHV use. Unauthorized OHV trails have become established in the Copper Creek drainage due to the Snow Talon fire of 2003. Although elk use remains heavy in key habitats whether or not temporal use patterns have shifted to avoid disturbance is unknown.

***North Belts Landscape*** - Much of the Favorite Gulch-Devils Tower region is designated as a Roadless Area, but it is full of long-established primitive roads. Many are not mapped or have been mapped inaccurately. These inaccuracies continue to be corrected by ongoing survey work. Vehicle use is heaviest during the hunting season—although impacts to elk are minimal since few animals return to the area until early winter. A few elk were observed in the North Hills burn portion of the area in November.

*Habitat Effectiveness:*

***Divide Landscape*** - The Elliston Face area is mostly timbered and has only a few primitive motorized routes (including a snowmobile trail) passing through. However, because of its proximity to Elliston and the urban interface, the general scarcity of summer habitat components, and the paucity of good winter forage, most elk use the area only for short periods of time in late fall/early winter and late winter/early spring. Proposed thinning of the mature timber stands (Elliston Fuels project) is unlikely to appreciably change use patterns. Rejuvenation of local aspen may improve browse potential and result in more use of the area by deer and elk.

In general, motorized intrusion into newly restricted areas has declined since previous surveys—most noticeably along the Little Corral and Brooklyn Bridge trail systems. OHV use of the Brooklyn Bridge road/trail system had increased noticeably in the 1990's, and after initial closure of the route to motorized traffic in 2003 violations were common. This year few motorized intrusions were detected. During the hunting season, most elk remained 2 miles or more beyond closure gates in the vicinity of upper Jackson Creek and Clarke Gulch. Some hunters walked in up to 2 miles, but most turned back after about 1 mile. In Little Corral Gulch, OHV trails pioneered 1999-2004 received less use in 2005. There was no sign of new off-trail riding in the meadows. No obvious changes in elk use were detected.

Elk and deer use in the Mt Helena area remains similar to that of previous years: elk tend to avoid the main foot trails, while mule deer are abundant throughout the area regardless of cover and human use patterns.

The newly discovered Black Mountain-Ophir Crk motorized trail has lowered summer habitat effectiveness and fall security for elk and deer in the region south of Black Mountain. At this point, elk continue to use the area in large numbers in summer and fall, taking advantage of widespread hiding cover as needed. The impact on hunting season mortality is unknown.

***Blackfoot Landscape*** - Some seasonal changes in use patterns appear to be occurring north of Highway 200 which may be influenced by natural successional changes in habitat condition, habitat changes associated with the 37,000 acre Snow Talon fire of 2003, and increased OHV activity.

***North Belts Landscape*** - Proposed water developments and fencing changes will (1) benefit wildlife by excluding cattle from riparian areas to which they currently have access or (2) shift the focus of local livestock grazing in ways that are essentially neutral for key wildlife species. One new water development

proposed for Elk Ridge should increase cattle grazing in an area that is currently shunned by elk because of rank, coarse grass growth—and is likely to draw elk back into this otherwise favorable site in spring and fall.

In Favorite Gulch, primary changes influencing wildlife use patterns in recent years are the expansion of the motorized trail/road network, elimination of forest by the North Hills fire in the northern half of the area, and loss of grass-shrub habitat to encroaching conifers in the southern half of the area. There is little open water most of the year, and elk and deer are scarce from April through November. Forest cover is naturally fragmented and interior forest wildlife is meager. Open-habitat and edge wildlife is abundant. Key habitat elements include timbered sites in draws, large old trees, extensive grass-forb associations that provide winter forage, aggregations of mountain mahogany, and possibly, widespread Rocky Mountain juniper (which is often classified as an encroaching species to be eliminated from both grassland/shrubland and forest habitats).

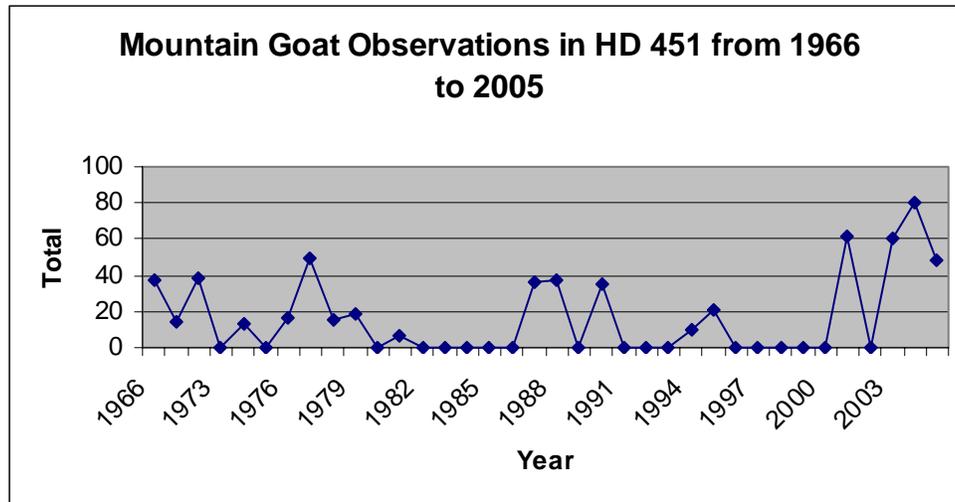
The North Hills burn is now over 21 years old. It covers 27,000 acres—much of it in the Gates-of-the-Mountains Wilderness. Grass-forb associations are vigorous and diverse in the Big Log-Hunters Gulch region and provide year-round habitat opportunities for elk and deer. The Devils Tower area is drier: shortgrass-dominated habitats are most common and serve primarily as winter range. Because the Hunters-Big Log region is unroaded, it provides fall security for elk, in spite of the scarcity of hiding cover. The Devils Tower region is more accessible to motorized use, forcing elk to confine themselves to more remote portions of the area in the fall. Foraging opportunities for native herbivores are excellent year-round. Conifer regeneration is extremely limited. Even in areas where mature trees survived the fire, regeneration is restricted to their immediate vicinity. In essence, for much of the area, the fire has generated a type conversion from forest to grassland. Elk and deer use is heavy locally—concentrating on the best forage (often at the heads of drainages). Forest cover of any kind is unlikely to return to much of the area for many decades, if not centuries.

#### Aerial Surveys:

**Elk** - Surveys results for all three hunting districts – 390, 391, and 392 – indicate an overall decrease in total numbers between 2004 and 2005. However, all hunting districts were within the range of population parameters. MTFWP personnel surmise that the higher numbers in 2004 for HD 390 may have been the result of immigration into this hunting district from HD 312 due to a late season hunt. The following table summarizes elk numbers by hunting district for 2004 and 2005.

Summary of elk observations in Hunting Districts 390, 391, and 392 for 2004 and 2005														
Hunting District	Total		Cows		Calves		Yearling Bulls		Brow-tined Bulls		Total Bulls		Unclassified	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
390	1743	995	1499	673	116	213	85	50	43	59	128	109		
391	553	261	399	155	59	79	39	24	56	3	95	27		
392	1183	1007	964	713	142	222	66	65	11	7	77	72		

**Mountain Goat** - A total of 50 goats were observed in 2005 compared with 80 that were observed in 2004. The following figure summarizes total number of goats observed from 1966 to 2005.



#### Variability Measure Discussion:

Many components of this monitoring element do not lend themselves to direct comparison with the variability measure identified in the Forest Plan. Where applicable, the variation relative to the Forest Plan measure is described; otherwise, variation is qualified.

##### *Variability Measure:*

-10% from previous measurements

##### *Assessment:*

##### *Cover and Forage:*

Changes in the amount of cover and forage between FY04 and FY05 are negligible at less than 1%. Based on the monitoring results, this portion of the element is within the acceptable variation of -10%.

##### *Open Road Densities:*

The changes between 1991 and 2003 indicate a reduction in road densities of 25%. Although this portion of the monitoring element exceeds the variability measure, it's important to note that these changes are for a twelve year period. The variability measure is based on bi-annual changes. Also, continuation of this practice would not result in serious consequences.

##### *Road Closure Effectiveness:*

**Wagner Atlanta** - Since this was the first year of road closure effectiveness monitoring in the Wagner Atlanta project area, there are no comparisons to be measured.

**Divide Landscape** - The motorized intrusion into unroaded habitat in the Black Mountain area represents a significant negative impact on the quality of habitat in this area. Overall, this deviation remains acceptable within the context of the Continental Divide linkage zone (although the effects accumulate); but it is unacceptable in terms of its effect on local wildlife movement and habitat use.

Continued motorized use of routes in the Little Coral Gulch area and over the Tenmile divide in the Clancy-Unionville area compromises integrity of elk security areas delineated in the Clancy-Unionville EIS. This is outside the limits of what was intended in the Clancy-Unionville analysis.

**Blackfoot Landscape** - Although elk use remains heavy in key habitats whether or not temporal use patterns have shifted to avoid disturbance is unknown. There is no assessment at this time, therefore.

**North Belts Landscape** - Current motorized route density in the Favorite Gulch/Devils Tower area is outside the expectations of the Forest Plan with regard to elk habitat effectiveness and roadless area potential. Implementation of the Belts Travel Plan should remedy this problem.

Habitat Effectiveness:

**Divide Landscape** – In the Clancy-Unionville project area (Brooklyn Bridge, Little Corral Gulch), closure of numerous motorized routes in 2003 theoretically improved habitat effectiveness substantially. However, in practice, numerous violations kept effectiveness at considerably lower levels. It appears that compliance is now beginning to take in the areas monitored and that actual habitat effectiveness is moving closer to its theoretical potential.

**Blackfoot Landscape** – There is no assessment of variation.

**North Belts Landscape** - Range improvements continue to proceed. Fuels treatment in the Favorite Gulch area are compatible with Forest Plan direction for local management areas—primarily L-2 and W-2. In the North Hills, the conversion of thousands of acres from forest to grass-shrub habitat over the long term is not within the general range of expectations of the Forest Plan.

Aerial Surveys:

**Elk** - Total number of elk decreased in 2005 by 43% in HD 390, 53% in HD 391, and 15% in HD 392. This monitoring element is designed to address changes in habitat not necessarily changes in numbers of animals. However, the changes in total number of elk observed between 2004 and 2005 in all three hunting districts reflect a >10% decline. The changes are not related to a management oriented practice.

**Mountain Goat** - Overall, mountain goat observations have fluctuated since 1966 but they remain above average for 2005 even though there is a decrease of about 37% in the total observed between 2004 and 2005. Similar to the elk analysis discussion, this monitoring element is not necessarily designed to track changes in numbers of animals. Although there is a 37% decline in total numbers observed between 2004 and 2005 the changes are not related to a management oriented practice.

Actions in Response to Variability Assessment:

There are no actions needed at this time.

**Recommended Efforts:**

As program funding and priorities allow, we recommend that we use aerial photography updated every 5 years to address this monitoring element in conjunction with existing databases.

Continue occasional monitoring of the Continental Divide and old Deadman trails to ensure that they remain free from motorized use.

Portions of the Continental Divide trail that have been disrupted by intrusion of the clandestine Black Mountain motorized trail have already been re-signed. Law enforcement personnel have recommended using available crews (most likely fire crews early in the season) to blockade and sign the motorized trail as an illegal route. Regular monitoring should be undertaken to ascertain effectiveness.

Continue to monitor human and big game use patterns along the Black Mountain trail once it is physically blocked and signed as an illegal motor route in the future.

Continue travel plan implementation (i.e. signing and physical blockage of routes) in the Clancy-Unionville project area to improve wildlife security and habitat effectiveness.

Continue monitoring in the Clancy-Unionville area to track progress in travel plan compliance (and consequent habitat effectiveness) as more effective signing and physical barriers are established. It will be particularly important to establish baseline patterns of big game use in relation to road and trail locations prior to planned forest thinning—which is now likely to occur within the next 1-3 years.

Continue monitoring OHV use and its potential impacts to wildlife north of Hwy 200 particularly in the Copper Ck, Keep Cool, and Sucker Ck drainages where the greatest increase in ATV use has occurred. Expand monitoring efforts along the Continental divide in the Stemple, Flesher, and Rogers Pass areas for potential impacts during elk calving and summer habitat security.

Now that the North Belts Travel Plan is being implemented, routes surveyed over the last 3 years (Favorite Gulch, Beartrap Gulch, Hidden Valley, Hogback, Bull-Sweats, Cave Gulch, Hedges Mtn) will need to be monitored to determine the effectiveness of vehicle closures and the reaction of wildlife to the changes proposed. The Favorite Gulch-Devils Tower network is likely to prove problematic during the hunting season.

Follow up with monitoring after projects are completed to gauge the accuracy of initial predictions as to wildlife and habitat response

In Favorite Gulch, some additional monitoring of how big game species use the area is needed—primarily in winter. Also, the role of Rocky Mountain juniper as a wildlife resource needs to be examined in more detail. More thorough analysis of field monitoring results will be needed before detailed recommendations can be made.

In the North Hills, current conclusions are based on a relatively short-term sequence of observations. Extensive monitoring needs to continue. Establish long-term photo points in both areas to illustrate more systematically changes in forage and cover in stand replacing burns vs low intensity fire in dry forest types—and the implications for big game populations.

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## **(C5) Bighorn sheep habitat suitability, indicator species**

### **Forest Plan Requirements:**

Bighorn sheep habitat suitability will be monitored to be able to respond from any unacceptable deviation from past measurement. This monitoring element applies to Management Areas W1, P1, and P2.

#### *Intent:*

To be able to respond to any unacceptable deviation from past measurement.

### **Data Sources:**

Montana Department of Fish, Wildlife and Parks Region 4 aerial surveys (Forest Plan suggested data sources). Specifically, data are derived from annual surveys conducted by Montana Department Fish, Wildlife, and Parks (MTFWP) personnel for the Elkhorns (Region 3). Monitoring specific to MAs W1, P1, and P2 was not conducted in 2005 because MTFWP conducts annual surveys where bighorn sheep are

present and in order to determine if there is a need to regulate hunting. Therefore, surveys and data are limited to areas within which MTFWP conducted aerial surveys. Data are filed at the Supervisor's Office and include:

- Bighorn sheep surveys in Hunting District 380 for 2004 and 2005

### Current Efforts and Findings:

#### *Documentation of Monitoring Methodology:*

Aerial surveys are utilized by MTFWP personnel, annually, to develop trend data to determine if the population under consideration is within the population goals as described species-specific management plans. Subsequently, these data are used to establish amount of type of hunting permits for the following year. See MTFWP Memos in project file for more details on methodology.

#### *Monitoring Activity:*

Bighorn sheep aerial surveys were conducted on April 16<sup>th</sup>, 2005 by MTFWP.

#### *Data Analysis Methods:*

Other than general observation summaries, no data analyses are conducted for this element.

#### *Monitoring Results:*

A total of 163 sheep were counted in 2005, the highest count since surveys were initiated. In 2004, a total of 132 sheep were counted. Lamb production was relatively good with a total of 28 lambs observed with a ratio of 34.0 lambs per 100 ewes (compared to 2004 with a total of 29 lambs observed with a ratio of 37.2 lambs: 100 ewes). A total of 48 rams, 15 of which are considered 'legal', were observed but not all of them were classified. A total of 7 'legal' rams were counted in 2004. The population objective for bighorn sheep in the Elkhorns is 250 sheep.

Bighorn sheep in the Elkhorns are originally from transplants which began in the winter of 1995/96, supplemented in 1996/97 and in 2000. A total of 75 sheep have been released at 2 different release sites. Radio collars and individually marked neckbands were placed on a total of 58 sheep. During the 2005 survey effort, approximately 6 marked animals were observed indicating they are phasing out of the population and most sheep observed are now Elkhorn Mountain "natives". Intensive telemetry work has provided seasonal range distribution for this growing sheep herd. Sheep have established traditional seasonal ranges, primarily in the Crow and Indian Creek drainages. Approximately one-quarter of the sheep are migratory just prior to lambing and use the Beaver Creek drainage. The distribution information collected from the telemetry work proved valuable during this survey, as all sheep observed were within traditional wintering areas.

### Variability Measure Discussion:

#### *Variability Measure:*

-10% from previous measurements

#### *Assessment:*

The total number of bighorn sheep observed increased by approximately 23% in 2005 compared with 2004. The lamb composition decreased by 6%; lambs comprised about 22% of the total counted in 2004 compared with 16% in 2005. Rams increased by about 4% in 2005 relative to total counted; in 2004 they made up approximately 5% of the total counted and in 2005 they comprised about 9%.

The variation reflected in the total number of bighorn sheep counted between 2004 and 2005 exceeds the acceptable variation of  $\pm 10\%$ . However, the population objective is 250 bighorn sheep for the Elkhorns. Therefore, this increase of 23% is desirable. All other variation is within  $\pm 10\%$ .

*Actions in Response to Variability Assessment:*

There are no actions needed at this time.

**Recommended Efforts:**

Continue to rely on MFWP for primary field information on bighorn sheep population numbers and distribution. Discuss with MFWP the potential for initiating field surveys of occupied habitat.

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**(C6) Grizzly bear habitat effectiveness, indicator species**

**Forest Plan Requirements:**

Grizzly bear habitat effectiveness (habitat diversity, open road density) will be monitored to be able to respond to any unacceptable deviation from past measurement. This monitoring element is applicable for Management Areas P-1 and P-3 where they overlap with essential and occupied grizzly bear habitat (referred to as Management Situation (MS) 1 and 2 in the Forest Plan. See page II/19.). Therefore, this monitoring element is applicable only in P-1.

*Intent:*

To be able to respond to any unacceptable deviation from past measurement.

**Data Sources:**

Project EAs, grizzly habitat measurements (Forest Plan suggested). Specifically, the following data were used to compile this report:

- Moving window analysis from the FY04 Monitoring Report, filed at the Supervisor's Office and the Lincoln Ranger District.
- Annual grizzly bear foraging habitat surveys, filed at the Lincoln Ranger District
- General habitat summaries based on field observations, filed at the Helena Ranger District
- Northern Divide Grizzly Bear Project at <http://nrmsc.usgs.gov/research/NCDEbeardna.htm>

**Current Efforts and Findings:**

Road densities have not changed in grizzly bear habitat since the FY04 Monitoring Report. Those findings are excerpted from that report and presented below under Road Densities.

*Documentation of Monitoring Methodology:*

The protocol paper "Moving Window Motorized Access Density Analysis & Security Core Area Analysis for Grizzly Bear" was utilized for the moving window analysis. Documentation of the methodology is on file in the Supervisor's Office. General habitat observations were summarized. The Northern Grizzly Bear Project methodologies are described on their website.

*Monitoring Activity:*

Road Densities:

Road densities for the Helena National Forest Portion of the Northern Continental Divide Ecosystem (NCDE) were reported in the FY04 Monitoring Report based on a moving windows analysis and area density analysis.

Summer Foraging Habitat:

Mid to late-summer surveys were conducted to assess grizzly bear foraging activities at a known army cutworm moth feeding site on the Lincoln Ranger District. The District has been conducting these observations for several years to count the number of individuals feeding in the area at a given time.

General Habitat Observations:

Habitat surveys along the Continental Divide identified areas that could provide grizzly bear habitat and the position of these areas in relation to roads, new building, and other human developments accumulating along the Divide. Surveys conducted in the region where grizzlies are most often reported on the Helena District were in the upper Deadman Creek, Black Mountain, Nevada Mountain, and Ophir Creek area. Survey notes can be found in the project file.

Grizzly Bear DNA Study:

The U.S. Geologic Survey in conjunction with the National Forests within the NCDE and other partners implemented a study to estimate the grizzly bear population size in the NCDE in 2002. Data will be used to estimate the number of grizzly bears in the NCDE. Information on the study design is in the project file.

Data Analysis Methods:

See the "Moving Window Motorized Access Density Analysis & Security Core Area Analysis for Grizzly Bear" for a discussion of data analysis relative to moving windows analyses. See the Grizzly Bear DNA website for a discussion of those data analysis processes. Otherwise, for general observation summaries, no data analyses are conducted.

Monitoring Results:Road Densities:

There have been no changes in road management for FY05, therefore the data reported in the FY04 Monitoring Report remain accurate. Those data are summarized below.

<b>Road Densities per the Forest Plan Standards</b>	
Subunit	Road Density
Red Mountain subunit	0.36
Arrastra Mountain subunit	0.47
Alice Creek subunit	0.14
Total (cumulative effect area)	0.34

<sup>1</sup>Forest Plan Standard is 0.55 mi/square mile.

The following table summarizes the results of the moving window analysis.

<b>Route Density and Core Security Areas in the Monture-Landers Fork BMU</b>			
Subunit	OMRD <sup>1</sup>	TMRD <sup>2</sup>	Core <sup>3</sup>
Alice Creek Subunit (<75% Forest Service management) (% of area meeting guideline)	15.8	19.5	74.8
Arrastra Mountain Subunit (% of area meeting guideline)	14.6	16.5	74.5
Red Mountain Subunit (% of area meeting guideline)	25.6	22	66.1

<sup>1</sup>Open motorized route density guideline: ≤19% of each subunit with >1.0 mile/mi<sup>2</sup>; if <75% FS land management, then no net increase in >1.0 mile/mi<sup>2</sup> open motorized route density class due to FS actions.

<sup>2</sup>Total motorized route density guideline: ≤19% of each subunit with > 2.0 mile/mi<sup>2</sup>; if <75% FS ownership, then no net increase in >2.0 mile/mi<sup>2</sup> open route density class due to FS actions.

<sup>3</sup>Core area (>2,500 contiguous acres, ≥0.3 mi. from motorized route, no roads or trails receive "high intensity use" (USDA 1990) and no motorized routes open during non-denning period) guideline: ≥68% of the subunit considered core area; if <75% FS ownership, then no net decrease in potential security core areas due to FS actions.

Summer Foraging Habitat:

Approximately 10,000 acres of high-elevation, scree slope, army cutworm moth site/grizzly bear foraging areas were reconnoitered in 2005. Grizzly bear use was present at several of the sites visited and several grizzly bears were identified using these areas. The highest use area on the district seems to be Sourdough Basin, west of Red Mountain, within the Scapegoat Wilderness. Numerous grizzly bears have been observed at this site over the past 25+ years.

General Habitat Observations:

Vehicle restrictions in the upper Little Prickly Pear watershed (including the Continental Divide trail) have improved the quality of habitat for grizzly bears on the east side of the Divide since 1999. However, a newly pioneered motor trail in the unroaded region south of Black Mountain has generated potential problems for grizzlies in that may use this area. Habitat in this area is excellent: Forested cover is abundant, whitebark pine is available, and pockets of wet productive habitat are well dispersed. No obvious grizzly bear sign was detected during field surveys (although black bears were sighted and scat found), but grizzlies have been reported from this area in recent years and they are undoubtedly still moving through. Information is on file at the Helena District Office.

Grizzly Bear DNA Study:

Data analysis and population modeling will be conducted during the summer and fall of 2006 with results anticipated in 2007. Therefore, there will be no further discussion of this item for 2005.

**Variability Measure Discussion:**

Many components of this monitoring element do not lend themselves to direct comparison with the variability measure identified in the Forest Plan. Where applicable, the variation relative to the Forest Plan measure is described; otherwise, variation is qualified.

**Variability Measure:**

-10% from previous measurements

***Assessment:******Road Density:***

The FY04 Monitoring Report summarizes the road density analysis used to determine if the variability threshold has been exceeded. Since there are no changes in road management in 2005, that analysis is still applicable and summarized as follows: An analysis conducted for the 1987 Monitoring Report indicated that at that time there were 58.6 miles of road in the NCDE excluding the Scapegoat Wilderness. This equated to an open road density of 0.40 miles/square mile. A habitat effectiveness estimate of 95% was also calculated based on methodologies described in the *Wildlife Documentation Helena National Forest 1983* located in the Supervisor's Office.

To determine if the variability measure has been exceeded, road construction and decommission data were compared with those calculated for the 1987 Monitoring Report. Open road densities in 2004 were 0.34 miles/square mile with a habitat effectiveness of approximately 96%.

Based on this FY04 analysis, the -10% variability that would initiate actions had not been reached. Since there have been no changes in 2005, this conclusion remains in effect.

	<b>1987</b>	<b>2004</b>
Open Road Density	0.40 miles/square mile	0.34 miles/square mile
Habitat Effectiveness	95%	96%

***Summer Foraging Habitat:***

Army cutworm moths provide an important food item for grizzly bears. Based on the presence of grizzly bears at this site for the past several years, there appears to be a re-occurring food base. Furthermore, since most of the grizzly bear concentrations are within the Scapegoat Wilderness, management activities should not affect the ability of this area as a forage base. Presence or absence of army cutworm moths is outside the scope of management-oriented practices. Also, the data are based on observations. Therefore, a variability determination will not be developed.

***General Habitat Observations:***

The absence of motorized use on the Continental Divide trail north of Black Mountain and throughout the area east of there represents an improvement (in terms of grizzly bear habitat effectiveness) over previous years. The presence of the new Black Mountain trail represents a decline in grizzly habitat quality in the area between Black Mountain and Ophir Creek. Overall, habitat quality as assessed through general observations, has remained about the same.

***Actions in Response to Variability Assessment:***

There are no actions needed at this time.

**Recommended Efforts:**

We recommend utilizing the Cumulative Effects Model (CEM) to determine changes in habitat effectiveness.

Continue annual monitoring of grizzly bear activities in known army cutworm moth habitats. Expand the effort toward the head of the Copper Bowls to the west of Red Mountain to document grizzly bear

activity. Part of this area is within the perimeter of the 37,000 acres Snow/Talon fire that burned in 2003.

Continue surveying habitat throughout the Divide corridor with the aim of producing a complete map of key habitat areas for grizzly bears and the human-induced barriers that compromise their use.

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### **(C7) Old growth habitat (Indicator species Pileated and Hairy Woodpeckers and Goshawk)**

#### **Forest Plan Requirements:**

Old growth habitat (Indicator species pileated and hairy woodpeckers and goshawk) is to be monitored to be able to respond to any unacceptable deviation from past measurement. This monitoring element is applicable to Management Areas M1, H1, H2, R1, T1-T5, W1, W2, and E1-E4.

#### *Intent:*

To be able to respond to any unacceptable deviation from past measurement.

#### **Data Sources:**

Project EAs, habitat sampling by transects of species density, TSMRS (Forest Plan suggested data sources). Additional data for this monitoring element have been compiled from the following sources:

- FIA old growth data as described in the FY04 Monitoring Report from "Detailed Estimates of Old Growth By Landscapes on the Helena National Forest" on file in the Supervisor's Office
- Northern Region Landbird Monitoring Program for pileated and hairy woodpeckers on file at the Supervisor's Office and at the following website: <http://avianscience.dbs.umt.edu/>
- FIA snag density estimates on file in the Supervisor's Office
- Regional Goshawk Surveys for 2005
- Project Level Goshawk Surveys for 2005
- Pileated and Hairy Woodpecker Observations

#### **Current Efforts and Findings:**

FIA data have not changed since the FY04 Monitoring Report. Those findings are excerpted from that report and presented below under Old Growth and Snag Densities.

#### *Documentation of Monitoring Methodology:*

FIA data are collected according to the methodology described at the following website:  
<http://www.fs.fed.us/rm/ogden/data-collection/field-manuals.shtml>.

FIA old growth data are based on methodologies described in "Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System" on file in the Supervisor's Office.

Monitoring methodology for the Northern Region Landbird Monitoring Program is located at the following website: [http://avianscience.dbs.umt.edu/documents/2004\\_LBMP\\_methods\\_000.pdf](http://avianscience.dbs.umt.edu/documents/2004_LBMP_methods_000.pdf)

FIA snag density estimates based on the methodologies described in "Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System" on file in the Supervisor's Office.

Regional goshawk survey protocols are described in "Survey of the Frequency of Northern Goshawk Presence in the Northern Region During 2005" and "USDA Forest Service Northern Region Landbird Monitoring Program Northern Goshawk Survey Field Methods" on file in the Supervisor's Office.

Project level goshawk surveys were conducted according to the "Helena National Forest Goshawk Monitoring Protocol" Version July 9, 2004. Goshawk surveys were also conducted as part of general field reconnaissance.

Pileated and hairy woodpecker observations were noted as a matter of course during field reconnaissance.

***Monitoring Activity:***

*Old Growth:*

Forest Inventory and Analysis (FIA) data were used to determine old growth acres Forest-wide and were summarized for the FY04 Monitoring Report. There are no updates for FY05. The results below are excerpted from the FY04 Report.

*Northern Region Landbird Data:*

Pileated woodpecker observations were summarized for 1994 through 2004. No data were collected in 2005. Data were collected according to the Northern Region Landbird Monitoring Program Field Methods. See the Avian Science Center Website at:

[http://avianscience.dbs.umt.edu/documents/2004\\_LBMP\\_methods\\_000.pdf](http://avianscience.dbs.umt.edu/documents/2004_LBMP_methods_000.pdf)

*Snag Densities:*

Snag densities were derived from the FSVEG Summary Database.

*Regional Goshawk Surveys:*

In 2005, the Forest Service decided to conduct a survey of goshawk presence in the Region One. The survey design and data collection protocol are described in "Survey of the Frequency of Northern Goshawk Presence in the Northern Region During 2005" and "USDA Forest Service Northern Region Landbird Monitoring Program Northern Goshawk Survey Field Methods". Twelve primary sample units (PSUs) were surveyed according to protocol (i.e. two visits per PSU) and an additional twelve PSUs were surveyed once. Since these latter twelve PSUs were not surveyed according to protocol, only positive detections are counted. In other words, since we did not survey these PSUs twice, our lack of detections could be related to survey effort.

*Project-Level Goshawk Surveys:*

Goshawks were monitored through a combination of walk-through surveys and calling surveys (with broadcast recorded calls). Surveys were generally conducted as part of general wildlife fieldwork conducted for a variety of primary purposes in forested habitat. Areas surveyed are summarized in the Table below by Landscape.

<b>Goshawk survey areas by Landscape</b>		
Big Belts	Divide	Blackfoot
Cabin Gulch	Elliston Face	Indian Meadows/Copper Creek
Greyson/Sulphur Bar	Little Corral Gulch	
Edith Holloway	Deadman Creek	
Jimtown	Brooklyn Bridge	

<b>Goshawk survey areas by Landscape</b>		
Big Belts	Divide	Blackfoot
Hanging Valley	Ophir Creek-Black Mountain	
Vigilante Gulch	Mt Helena Ridge	
Big Log Gulch	Kading-Limburger Springs	
Upper Willow Creek	Hope Creek/Spring Gulch	
Kelly Gulch		
Cottonwood-Sweats Gulch		
Grouse Ridge		

*Pileated and Hairy Woodpecker Observations:*

Woodpeckers were noted as a matter of course during all field operations. Concentrations of dead and dying trees, characteristic pileated woodpecker excavations, and other habitat components associated with woodpeckers were also identified.

*Data Analysis Methods:*

General observation data were summarized for a majority of the components in this discussion. Snag densities and old growth estimates were derived from the FSVEG Summary Database. See project file for detailed information on the summary database.

*Monitoring Results:*

*Old Growth:*

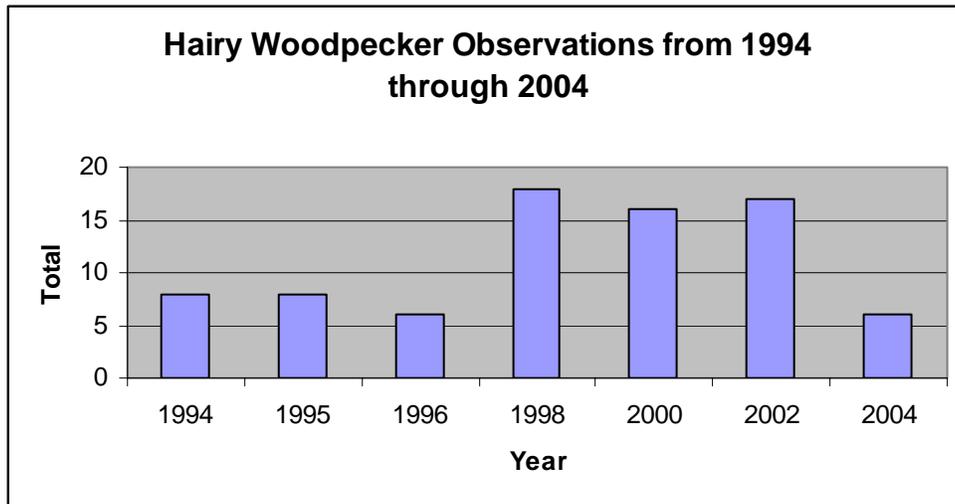
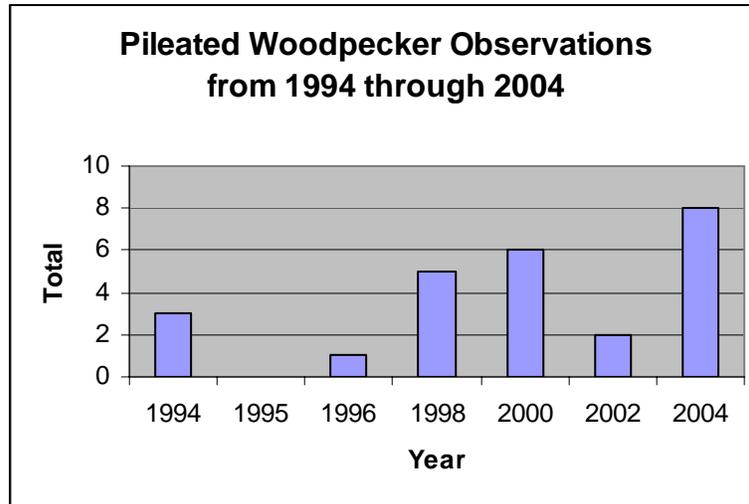
FIA data for the Helena National Forest was collected from 1996 – 1998. Ten percent of the FIA survey points are remeasured annually. The updated report will be forthcoming. The estimated percentage of old growth on all forested lands on the Helena National forest is 8.64% with a 90% confidence interval of 5.90% to 11.51%. The following table displays estimates of Forest-wide old growth by landscape.

<b>Old Growth Estimates by Landscape</b>				
Landscape	Number of Plots	90% CI For Percent Old Growth		
		Lower Bound	Point Estimate	Upper Bound
Big Belts	47	3.20%	8.09%	13.70%
Blackfoot	46	6.09%	11.30%	17.08%
Divide	33	1.54%	5.45%	10.00%
Elkhorns	13	1.43%	9.23%	18.67%

*Northern Region Landbird Data:*

Pileated woodpecker observations are summarized in the Figure below. No data were collected in 2005. Pileated woodpeckers are not common on the Helena National Forest. Other portions of Region One, particularly west-side Forests, generally have between 5-10% occurrence rates compared to 1.5% on the Helena Forest. This is less than 10 individual observations per year.

Hairy woodpecker observations are summarized in the Figure below. No data were collected in 2005. Hairy woodpeckers tend to be more common than pileated woodpeckers although the data indicate only slight increases in observations. Regionally, the Helena National Forest is about average in occurrence rates.



Snag Densities:

The following table summarizes snag densities per acre, Forest-wide. The 9 inch+ category includes all size classes; the 14 inch+ is a subset of the 9 inch category and the 21 inch+ is a subset of both the 9 inch and the 14 inch categories.

There are an estimated 12.6 snags per acre in the 9 inch+ size class Forest-wide providing habitat for a variety of snag associated species including pileated and hairy woodpeckers. The data indicate that snags in this size class are abundant and well distributed.

Forest-wide Snag Densities per Acre				
Diameter at Breast Height (dbh)	Number of Forested Plots	90% CI For Percent Old Growth		
		Lower Bound	Point Estimate	Upper Bound
9 inch plus	138	8.3	12.6	17.2
14-inch plus	138	0.7	1.1	1.8
21-inch plus	138	0.1	0.2	0.4

*Regional Goshawk Surveys:*

Regional efforts summarized in "Frequency of northern goshawk presence in the Northern Region 2005 Survey". Forest-wide efforts are summarized below and are distinguished between those surveys conducted to protocol and those only partially surveyed.

Summary of primary survey units conducted according to the "USDA Forest Service Northern Region Landbird Monitoring Program Northern Goshawk Survey Field Methods"		
Primary Sample Unit	Results	Comments
9478	Nest located	Gates of the Mountain vicinity
11156	No detection	NA
9237	Goshawk aural detection	NA
12403	No detection	NA
9121	Goshawk aural detection	NA
7569	No detection	NA
11825	No detection	NA
12298	No detection	NA
11028	No detection	NA
10533	No detection	NA
9726	No detection	NA
10531	No detection	NA

We detected goshawks at 6 out of 12 PSUs sampled. This is a 50% detection rate. We also located two new nests.

Summary of primary survey units partially conducted according to the "USDA Forest Service Northern Region Landbird Monitoring Program Northern Goshawk Survey Field Methods"		
Primary Sample Unit	Results	Comments
9478	Nest located	NA
11156	No detection	NA
9237	Goshawk aural detection	NA
12403	No detection	NA

<b>Summary of primary survey units partially conducted according to the "USDA Forest Service Northern Region Landbird Monitoring Program Northern Goshawk Survey Field Methods"</b>		
<b>Primary Sample Unit</b>	<b>Results</b>	<b>Comments</b>
9121	Goshawk aural detection	NA
7569	No detection	NA
11825	No detection	NA
12298	No detection	NA
11028	No detection	NA
10533	No detection	NA
9726	No detection	NA
10531	No detection	NA

Three out of 12 PSUs sampled had detections. No detection rate is calculated since surveys were not conducted to protocol. However, one new nest was located.

Based on the results of the regional and project-level surveys, the frequency of goshawk detections suggests that goshawks are relatively common and well distributed across the Forest.

*Project-Level Goshawk Surveys:*

Sampling conducted during general survey work identified one new active nest in the Elliston Face project area but failed to locate birds at 3 sites known to have been occupied previously (Hope Creek/Spring Gulch, Little Corral Gulch, Brooklyn Bridge). The Spring Gulch site was visited twice under optimal conditions, and it is likely that those hawks have moved to a different nest site. Little Corral and Brooklyn Bridge were sampled under less favorable circumstances and no conclusions can be drawn as to whether the territories are occupied or not. Since both territories have been occupied for several years and local conditions have not changed (aside from less motorized disturbance), it is likely that they are still intact.

A goshawk was observed on Mt Helena Ridge, but no nest site or activity center identified. Goshawks were also observed in Indian Meadows but no new nests were confirmed. The only territory found to be defended by goshawks was at Jimtown. However, the nest was not located. Other activity centers surveyed may have been occupied, but the brevity and timing of survey efforts made detection less likely than with past surveys.

No goshawks were detected in Cabin Gulch, Greyson, or Holloway Gulch.

*Pileated and Hairy Woodpecker Observations:*

Pileated woodpeckers and their excavations were observed at the following locations:

<b>Observations of pileated woodpeckers by Landscape</b>		
<b>Big Belts</b>	<b>Divide</b>	<b>Blackfoot</b>
Vigilante Gulch	Elliston Face	Copper Creek
Big Log Gulch	Little Corral Gulch	Beaver Creek
Kelly Gulch	Ophir Creek	

These woodpeckers require large trees for nesting, and prefer them for feeding, but none of our observations in the Divide Landscape were in old-growth stands. Rather, they were in mature or mixed-aged stands with a liberal smattering of large old trees—either scattered individually or in clumps (Douglas-fir, ponderosa pine, aspen, cottonwood).

Hairy woodpeckers were ubiquitous in virtually every habitat configuration other than open grassland/shrubland across the Forest.

#### **Variability Measure Discussion:**

Many components of this monitoring element do not lend themselves to direct comparison with the variability measure identified in the Forest Plan. Where applicable, the variation relative to the Forest Plan measure is described; otherwise, variation is qualified.

##### ***Variability Measure:***

-10% from previous measurements

##### ***Assessment:***

##### ***Old Growth:***

As the FIA data are re-measured and the analysis updated, this information will be included in those out-year monitoring reports for which the updates exist. There is no variability assessment for FY05 because there are no changes to report. This report is considered baseline information for future variability analyses.

##### ***Northern Region Landbird Data:***

The data for both the pileated and hairy woodpecker vary among data collection years. These data are intended to identify long-term trends, not between year variations. Therefore, there is no variability assessment.

##### ***Snag Densities:***

Similar to old growth, as FIA data are re-measured and analyses updated, this information will be included in out-year monitoring reports. There is no variability assessment for this report.

##### ***Regional and Project-Level Goshawk Surveys:***

Variability is not assessed for this portion of the element. We have increased survey efforts in 2005 through the addition of the regional component. Therefore data are not comparable between years at this time.

##### ***Pileated and Hairy Woodpecker Observations:***

The data are based on observations. Therefore, a variability determination will not be developed.

##### ***Actions in Response to Variability Assessment:***

There are no actions needed at this time.

#### **Recommended Efforts:**

##### ***Old Growth:***

Old growth units can be defined based on the four landscapes on the Forest. As program funding and priorities allow a percentage of each landscape would be monitored annually to determine variability.

*Northern Region Landbird Data:*

As program funding and priorities allow, we recommend continuing participating in this program as its long-term trend monitoring contributes to our understanding of bird species diversity across the Forest.

*Snag Densities:*

As program funding and priorities allow, we recommend implementation monitoring in project areas to determine if snag recommendations have been met.

*Goshawk Surveys:*

Continue systematic survey of previously-occupied ranges and continue to investigate potential home ranges as indicated by 2002-2005 mapping and by recent fortuitous sightings. Employ intensive sampling where goshawks have previously been located and more extensive sampling in areas where they have not been found so far.

*Pileated and Hairy Woodpecker Surveys:*

Continue to monitor as a matter of course during all field surveys. Note the presence of pileated woodpeckers in particular, and the structure of habitats with which they are associated (as they are uncommon and appear to be adapted to habitats other than classic old-growth in this area).

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**(C8) Mature conifer suitability, indicator species****Forest Plan Requirements:**

Mature conifer suitability is to be monitored to be able to respond to any unacceptable deviation from past measurement. This monitoring element is applicable to Management Areas T1-T5, W1, W2, and E1-E4.

*Intent:*

To be able to respond to any unacceptable deviation from past measurements

**Data Sources:**

Project EAs, habitat sampling by transects of marten use, TSMRS (Forest Plan suggested data sources). Specifically, FIA data, general habitat surveys, and winter track surveys were utilized on file at the Supervisor's Office.

**Current Efforts and Findings:**

FIA data have not changed since the FY04 Monitoring Report. Those findings are excerpted from that report and presented below under FIA data.

*Documentation of Monitoring Methodology:*

- FIA data are collected according to the methodology described at the following website: <http://www.fs.fed.us/rm/ogden/data-collection/field-manuals.shtml>.
- General habitat surveys included identification of suitable marten habitat during field reconnaissance.
- Winter track surveys consisted of either snowmobiling or skiing and identification of tracks as encountered.

***Monitoring Activity:****FIA Data:*

Forest Inventory and Analysis (FIA) data were used to determine mature forest habitat acres Forest-wide and were summarized for the FY04 Monitoring Report. There are no updates for FY05. The analysis below is excerpted from the FY04 Report.

*General Habitat Surveys:*

Suitable marten habitat was noted wherever encountered during survey work.

*Winter Track Surveys:*

Winter track surveys for marten were conducted in conjunction with lynx track surveys in the Beaver Creek Road, Dalton Mountain area and Stemple Pass area. Survey days for 2005 were fewer than in previous years due to poor snow conditions and limited snowfall.

***Data Analysis Methods:***

Mature conifer estimates were derived using the FSVEG Summary Database that provides a statistical estimate with confidence intervals using FIA data. General observation data were summarized for a majority of the components in this discussion

***Monitoring Results:****FIA Data:*

Updated FIA data were used to estimate marten habitat across the Forest. Marten habitat was defined based on a preliminary marten model developed by Region One Regional Office.

The analysis indicates that the estimated percent of marten habitat (as defined by the marten model) on all forested lands on the Helena National Forest has a mean of 24.3% with a lower limit of 19.6% and an upper limit of 29.2% (90% confidence interval). The table below identifies mature (marten) habitat by landscape.

<b>Marten Forest Habitat By Landscape (source FIA data)</b>	
Landscape Area	Marten Habitat (Acres)
Big Belts	82,808
Elkhorns	10,771
Divide	47,190
Blackfoot	56,823
Total	197,593

*General Habitat Surveys:*

Suitable habitat in the Divide Landscape for marten was noted in upper Ophir Creek, upper Deadman Creek, Little Corral Gulch, upper Jackson Creek, upper Clark Gulch, Frohner Basin, upper Lump Gulch, and South Fork Quartz Creek, as well as on Black Mountain, south of Slate Lake, and in forested areas around Limburger Springs. Suitable habitat (particularly with large woody debris) is widely available throughout the Divide landscape, but most often, separated from other such patches by less optimal habitat (forested but without abundant large snags and logs).

Marten habitat in the north Big Belts is fragmented because of the inherent abundance of dry Douglas-fir, ponderosa pine, and grass/shrub habitats and the presence of large burns with scant regeneration. Most suitable habitat noted in surveys was in the bottoms of gulches and creeks, on higher elevation north and east slopes, and in the upper ends of drainages. Good blocks of habitat were noted in upper Willow Creek, Hanging Valley, Vigilante Gulch, and upper Big Log Gulch (all sites noted previously). The Favorite Gulch area contained very little suitable marten habitat, and that present was often widely separated from other such habitat patches by extensive open grassland and shrubland.

Winter Track Surveys:

Approximately 30 miles of road and trail systems were surveyed during the winter of 2005. Marten tracks were identified in along the Beaver Creek road. Poor snow conditions limited the number of survey days in 2005 and fewer tracks were recorded than in previous years when snow conditions were more favorable to tracking efforts.

**Variability Measure Discussion:**

Many components of this monitoring element do not lend themselves to direct comparison with the variability measure identified in the Forest Plan. Where applicable, the variation relative to the Forest Plan measure is described; otherwise, variation is qualified.

***Variability Measure:***

-10% from previous measurements

***Assessment:***

FIA Data:

As the FIA data are re-measured and the analysis updated, this information will be included in those out-year monitoring reports for which the updates exist.

General Habitat Surveys:

Data are insufficient to estimate variability.

Winter Track Surveys:

Snowfall, winter conditions, and scheduling vary from year to year which contribute to variations in snow tracking results. Additionally, the Snow Talon fire of 2003 which burned 37,000 acres resulted in a shift of survey efforts so a new baseline of information is being established.

***Actions in Response to Variability Assessment:***

There are no actions needed at this time.

**Recommended Efforts:**

FIA Data:

As program funding and priorities allow marten habitat should be monitored utilizing FIA data and supplemented with presence/absence and habitat use surveys.

General Habitat Surveys:

As program funding and priorities allow, initiate systematic mapping of suitable habitat from field records (1992 to present).

*Winter Track Surveys:*

Conduct winter tracking surveys in areas not covered by FWP survey routes to verify presence of marten in suitable habitat areas (as well as wolverine, lynx, fisher). Continue conducting pine marten track surveys in conjunction with lynx tracking surveys.

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**(C9) River and lake system suitability, indicator species (bald eagle)****Forest Plan Requirements:**

River and lake system suitability will be monitored using bald eagle nesting habitat as an indicator to be able to respond to any unacceptable deviation from past measurements. This monitoring element is applicable to Management Areas R1, W1, and P2.

*Intent:*

To be able to respond to any unacceptable deviation from past measurements.

**Data Sources:**

Project EAs, habitat surveys of nesting areas (Forest Plan suggested data sources). Specifically, general field observations were compiled for this element. Reports are available on file at the Helena and Lincoln Ranger Districts. This year we did not survey existing eagle nests but rather concentrated survey efforts in areas of bald eagle observations in order to determine nesting potential.

**Current Efforts and Findings:***Documentation of Monitoring Methodology:*

General field reconnaissance was utilized for all portions of this element.

*Monitoring Activity:*

Portions of the Little Blackfoot River corridor (from U.S. Highway 12 southward to the confluence of Ontario Creek) were surveyed for active bald eagle nests. In particular, mature forest habitats along the east edge of Elliston Face were examined for eagle nesting potential.

A bald eagle nest was monitored annually within the Blackfoot Landscape from 1989 to 2004. The nest site is located on private land adjacent to the Blackfoot River near Beaver Creek.

*Data Analysis Methods:*

General observation data were summarized. Field notes are in the project file.

*Monitoring Results:*

No eagle nest was along the Little Blackfoot corridor. The birds seen along the river near Elliston may belong to the long-established nest at Lois Lake in the Snowshoe Creek drainage to the northeast or to an unidentified nest off the Forest lower on the Little Blackfoot. No good nesting sites were located in or adjacent to the proposed Elliston Fuels project area.

In 2005 the nest within the Blackfoot Landscape was occupied by osprey and no alternate bald eagle nest site was found. No other nests are known for the Blackfoot Landscape. Wintering bald eagles are noted in the Blackfoot River corridor annually. The reason for the change in bald eagle nesting activity is unknown. No significant land management actions occurred in the vicinity of the nest and public access is limited due to private land ownership.

**Variability Measure Discussion:***Variability Measure:*

Any loss of an eagle nest

*Assessment:*

A variability assessment is not conducted for this monitoring element since known nests on-Forest were not monitored and the nest in the Blackfoot Landscape, currently occupied by ospreys, is on private land.

*Actions in Response to Variability Assessment:*

There are no actions needed at this time.

**Recommended Efforts:**

As program funding and priorities allow monitor all known nests in the Missouri River Corridor. Initiate a search for additional nests in the Gates of the Mountains.

As program funding and priorities allow continue surveying the upper Little Blackfoot River corridor more intensively. The potential for bald eagle nesting sites appears good. If possible, follow eagles' flight trajectories insofar as possible in order to narrow down nest site possibilities.

Continue monitoring the Beaver Creek nest area for bald eagle presence and to determine if ospreys continue to successfully utilize the nest site. Follow up on reports of eagle observations and monitor upstream and downstream segments of Blackfoot River for potential new nest sites.

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**Additional Wildlife Monitoring Outside of Forest Plan Requirements**

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**Flammulated Owls***Monitoring Activity:*

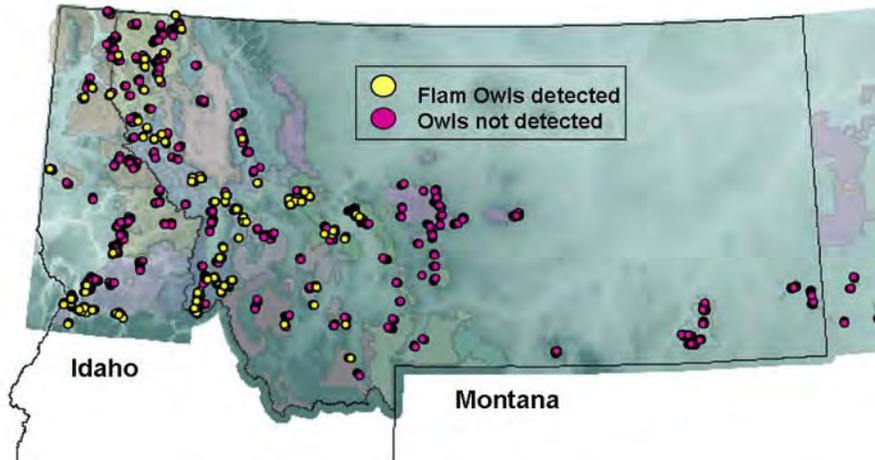
Flammulated owls were surveyed, region-wide, in 2005 in order to develop baseline data on the extent of flammulated owls regionally. Owls were surveyed as part of the Northern Region Landbird Program and according to the protocol located at the following website:  
[http://avianscience.dbs.umt.edu/documents/2005\\_flammmethods.pdf](http://avianscience.dbs.umt.edu/documents/2005_flammmethods.pdf).

A total of 260 points were surveyed on the Helena National Forest.

*Monitoring Results:*

Flammulated owls were detected on approximately 41 points. Probability of presence was calculated at 0.512. Data analysis and results are described in "2005 Flammulated Owl Surveys Final Report" located at the following website and on file at the Supervisor's Office:  
[http://avianscience.dbs.umt.edu/documents/finalreport\\_FLAMS\\_2005.pdf](http://avianscience.dbs.umt.edu/documents/finalreport_FLAMS_2005.pdf)

The following map illustrates flammulated owl detections region-wide.



Flammulated owls were not known to be present in the Mt. Helena area until 1989, when a juvenile bird was observed in upper Grizzly Gulch. Observations from 2003, 2004, and 2005 suggest that they are more widespread than had been previously known, although uncommon and difficult to detect. At this point, data are too scant to allow any conclusions as to year-to-year variability.

*Recommended Efforts:*

Survey the Mt Helena Ridge more extensively, beginning in April, to see if more owls are present. Follow up with more intensive monitoring of sites where owls have been located to identify nesting habitats. Look into the potential for generating a research project to examine these habitat relationships in more detail—as they appear to be somewhat atypical.

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## Black-backed Woodpecker Surveys/Cabin Gulch

*Monitoring Activity:*

Black-backed woodpecker surveys were conducted in the Cabin Gulch project area. The methodology is described in "Designing Field Studies to Detect Habitat Change for Cavity-Nesting Birds" on file in the Supervisor's Office. Transects were established through a 2-step process. Initially, areas were identified as either insect 'abundant' areas (based on aerial insect flights) or areas relatively free from high insect activity. Once these areas were identified, transects were generated within each type of polygon. Of those, a subset of transects were randomly selected.

*Monitoring Results:*

Seventeen transects were surveyed in the Cabin Gulch project area. No black-backed woodpeckers were observed although there were observations of hairy, downy, and three-toed woodpeckers.

*Recommended Efforts:*

Continue to survey the project area in 2006.

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## Black-backed Woodpecker Surveys/Snow Talon

### *Monitoring Activity:*

Black-backed woodpecker surveys were conducted in the Snow Talon project area. The methodology is described in "Designing Field Studies to Detect Habitat Change for Cavity-Nesting Birds" on file in the Supervisor's Office.

### *Monitoring Results:*

Fifty one transects were surveyed in the project area in 2005. Thirty-four observations were recorded for three-toed woodpeckers, 34 black-backed woodpeckers, 17 hairy woodpeckers, and 1 Northern goshawk. Different levels of use were noted in association with varying burn intensity within the survey areas.

### *Recommended Efforts:*

Conduct post-harvest surveys in survey areas where limited salvage logging occurred to compare use with pre-harvest surveys.

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## Black-backed Woodpecker Surveys/Cave Gulch

### *Monitoring Activity:*

Black-backed woodpecker surveys were conducted in the Cave Gulch project area for the fourth and final year. The methodology is described in "Designing Field Studies to Detect Habitat Change for Cavity-Nesting Birds" on file in the Supervisor's Office.

### *Monitoring Results:*

Surveys resulted in three observations of BBWO, other species observed include; three-toed woodpecker, downy woodpecker, red-tailed hawk and blue grouse.

### *Recommended Efforts:*

There are no recommended efforts as this was the last year for data collection.

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## Birds and Burns Network

### *Monitoring Activity:*

This project is part of the Joint Fires Sciences Program investigating the effects of prescribed fire strategies to restore wildlife habitat in ponderosa pine forests of the interior west. The North Elkhorns is one of 9 study sites selected by the Rocky Mountain Research Station to conduct effectiveness monitoring for prescribed fire to quantify reductions in fuel, and evaluate effects of fuel reductions on habitat and populations of the avifauna (and small mammals in selected locations).

A total of 41 transects were established in 2003. These were systematically placed 200 m apart on the four study sites. These same transects were used in 2005 to search for woodpeckers and their nests. Each transect was visited at a minimum of one time. This included using a play-back device to increase the probability of encountering a woodpecker. Transects where woodpeckers were detected were repeatedly visited to locate woodpecker nests. The 2005 Final Report is on file in the Supervisor's Office.

### *Monitoring Results:*

We located and monitored 31 nests in the 2005 field season (See Table below). Nest success (percentage of nests that successfully fledged at least one young) in 2005 was 77 percent with

24 of 31 nests fledging at least one chick. This is comparable to the 2004 season when we had 76 percent nest success (25 of 33 nests). Nest success in 2003 was 87 percent where we observed only 3 of 23 nests failing. Nest success may have appeared to be higher in this first year, however, because we found nests later in their development and missed some early failures. It is common to find more nests, and earlier in the nesting stage, in subsequent years of a cavity-nesting study after field observers become familiar with the study site and woodpecker territories.

<b>Number of nests monitored, and the number that successfully fledged at least one young during the 2005 field season</b>						
		Unit				All units combined
		MC <sup>1</sup>	MT	SC	ST	
Downy Woodpecker	Number of nests monitored	0	1	0	1	2
	Number of nests that successfully fledged young	0	1	0	1	2
Hairy Woodpecker	Number of nests monitored	1	2	0	2	5
	Number of nests that successfully fledged young	0	2	0	2	4
Mountain Bluebird	Number of nests monitored	0	1	0	0	1
	Number of nests that successfully fledged young	0	1	0	0	1
Northern Flicker	Number of nests monitored	0	1	0	2	3
	Number of nests that successfully fledged young	0	0	0	2	2
Red-naped Sapsucker	Number of nests monitored	6	8	2	1	17
	Number of nests that successfully fledged young	5	6	1	1	13
Northern Three-toed Woodpecker	Number of nests monitored	0	1	0	1	2
	Number of nests that successfully fledged young	0	0	0	1	1
Williamson's Sapsucker	Number of nests monitored	1	0	0	0	1
	Number of nests that	1	0	0	0	1

<b>Number of nests monitored, and the number that successfully fledged at least one young during the 2005 field season</b>						
		Unit				All units combined
		MC <sup>1</sup>	MT	SC	ST	
	successfully fledged young					
Totals	Number of nests monitored	8	14	2	7	31
	Number of nests that successfully fledged young	6	9	1	7	24

<sup>1</sup> MC = Maupin control; MT = Maupin treatment; SC = Strawberry control; ST = Strawberry Treatment

**Recommended Efforts:**

Continue data collection in 2006.

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**Mountain Goat Monitoring**

**Monitoring Activity:**

Mountain goat monitoring was conducted during the summer months by FS personnel in the Red Mountain and Stonewall Mountain areas. Ten goats were re-introduced into the area by FWP in 2002 and another 5 released in 2005. Montana FWP conducted four aerial surveys during 2005 performing observation counts and to locate goats that were fitted with radio transmitter collars prior to their release.

**Monitoring Results:**

No analysis of data was completed.

**Recommended Efforts:**

Continue monitoring Red Mountain/Stonewall mountain goat population for reproductive success and population estimates.

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**(C10-C13) Wildlife and Fish**

**(C10) Pools formed by instream debris, indicator species**

**Forest Plan Requirements:**

Pools formed by instream debris are monitored by collecting field data from 10, 1000-foot sample sections above and within timber harvest areas twice every five years.

**Intent:**

The intent is to insure that Forest management practices do not decrease pools formed by woody debris. This element was originally developed to determine the effect of riparian timber harvest on instream pool habitat as the 1986 Forest Plan did allow for some removal of trees adjacent to streams.

**Data Sources:**

Review of Inland Native Fish Strategy (INFISH 1995) Buffers on the Snow Talon Salvage Sale. The Forest Plan refers to 10, 1000 foot sample sections above and within timber harvest areas. These sections have not been monitored as there is no harvest occurring within stream buffers.

**Current Efforts and Findings:**

Monitoring of this element ceased in 1992 as harvest of trees that could become woody debris was not occurring. Following the Inland Native Fish Strategy (INFISH) being amended to the Helena Forest Plan in 1995 (Amendment #14), implementation of INFISH, and implementation of the State Streamside management (SMZ) law, there has been no action to remove streamside trees that could become instream pool habitat. Monitoring in 2005 consisted of review of marked INFISH buffers to document that buffers were maintained.

***Documentation of monitoring methodology:***

Monitoring for this element in 2005 was conducted by assessing the implementation of Infish buffers for the Snow Talon Salvage Sale. Marked buffers throughout the Copper Creek drainage were field evaluated by fishery biologists to ensure that logging activities did not occur within the marked boundaries.

***Monitoring Activity:***

In 2005 monitoring was conducted to ensure that Infish (1995) buffers were implemented on the Snow Talon Salvage Sale.

***Data Analysis Methods:***

By ensuring the INFISH buffers are being implemented then timber harvest fuels reduction outside the buffers have low potential to affect woody debris recruitment to streams.

***Monitoring Results:***

Monitoring of the buffers on the Snow Talon Salvage Sale found that the INFISH buffers were successfully maintained during logging operations and no harvest of trees that could become woody debris in streams, occurred (Burns 2004, Burns and Kaiser 2005).

**Variability Measure Discussion:*****Variability Measure:***

A decrease in pools from present levels (90% confidence)

***Assessment:***

The intent of the Forest Plan direction was met as no harvest of trees that could have become instream woody debris occurred.

***Actions in response to variability assessment:***

No action needs to be taken.

**Recommended Efforts:**

As pointed out in the 2002-2004 monitoring reports, the recommendation is to rely on meeting the requirements in the Montana Streamside Management Law (SMZ) and the Inland Native Fish Strategy (INFISH) to ensure management activities do not affect woody debris/pools on fishery streams. Continued project level monitoring on compliance with the SMZ Law and INFISH should ensure pool habitat is not affected by vegetation management activities.

## (C11) Intra-gravel sediment

### Forest Plan Requirements:

Substrate core samples are to be collected from spawning gravels to determine if the quality of spawning gravel is maintained. Nine samples from each of 30 sections are to be collected annually to determine statistical significance at the 90% confidence level.

#### *Intent:*

Determine if the quality of spawning habitat is being decreased by Helena Forest management actions

#### *Data Sources:*

Sediment Samples from McNeil Core Sampling. Nine samples from thirty 1000 ft sample sections as referenced in the Forest Plan have been replaced with 158 samples in 2005 from streams mostly from the Blackfoot River drainage in an effort to continue long term sediment evaluations in relation to level of management activities, to collect new information on a number of streams in different geologies, to assess conditions in drainages prior to conducting management activities, and to assess rates of sediment recovery following large fire events.

### Current Efforts and Findings:

#### *Documentation of monitoring methodology:*

Substrate fines by depth in spawning gravels that are less than ¼ inch in diameter are evaluated. Sampling is conducted using McNeil core sampler to collect stream substrates from likely spawning sites followed up with drying the samples, sieving the samples, and then weighing the samples by size class of substrate. The results are then used to determine the percentage of the sample by weight that is less than ¼ inch in diameter and to calculate a Fredle Index Information is portrayed both as a function of Percentage of fine sediment less than 6.4 mm and by the Fredle Index. The Fredle Index (Lotspeich and Everest 1981) is a measure of pore size and porosity and may be a better measure of stream gravel quality for salmonid spawning and rearing than just fine sediments less than 6.4 mm in diameter.

#### *Monitoring Activity:*

A total of 158 substrate core samples were collected from 21 different streams throughout the Forest in 2005. Streams sampled are shown in Table 1 below.

#### *Data Analysis Methods:*

Sampling of stream substrates is a direct means of measuring potential effects of Forest projects that are projected to result in increased delivery of sediment to fishery streams. The method is also useful as a means to estimate the baseline reproductive success of salmonids associated with the fine sediment levels in stream spawning gravels.

#### *Monitoring Results:*

Stream Name	Average Percentage of fine sediment less than 6.4 mm	Average Fredle Index Value
Deep Creek	38.1	3.1
East Fork Cabin Gulch	38.9	3.2
West Fork Cabin Gulch	45.3	2.9
Magpie Creek	41.5	2.8

<b>Table 1 - Fine sediment Levels and Fredle Indices (Lotspeich and Everest 1981) for spawning gravels from streams sampled on the Helena Forest in 2005</b>		
Stream Name	Average Percentage of fine sediment less than 6.4 mm	Average Fredle Index Value
Poorman Creek	33.1	4.2
Arrastra Creek	30.5	4.0
Blackfoot River above Lincoln near the confluence of Landers Fork	22.4	5.7
Blackfoot River below Lincoln near Dalton Bridge	31.4	3.8
Copper Creek	34.8	3.4
Snowbank Creek	38.3	3.1
Black Diamond Creek	30.7	4.4
Hogum Creek	33.9	4.0
East Willow Creek	35.9	3.0
Sauerkraut Creek	23.8	6.0
Wasson Creek	29.6	4.7
Upper Nevada Creek	41.0	3.9
Lower Nevada Creek	32.3	4.2
Moose Creek	32.1	3.6
West Fork Willow Creek	42.0	2.3
Stonewall Creek	31.6	4.3
Lower Landers Fork	28.8	5.0
Upper Landers Fork	46.2	2.0
Alice Creek	26.2	5.7

### Variability Measure Discussion

#### *Variability Measure:*

Annual decrease in Fredle Index from present (90% confidence)

#### *Assessment:*

Sediment levels in salmonid spawning gravels from samples across the Forest continue to indicate that drainages with similar geologic make-up with more human disturbance show elevated levels of fine sediments as compared to less disturbed drainages or reference streams where disturbance is limited to natural events. Even in the drainages where human disturbance is high, statistical differences between those drainages and less disturbed drainages have not been demonstrated- primarily due to the high variation present in the stream substrates in most samples and the large confidence intervals associated with the mean values. Sediment levels in Copper and Snowbank Creeks continue to be elevated as compared to most samples collected in years prior to the 2003 Snow-Talon Fire, but the elevated sediment levels are expected due to the increased sediment delivery during storm events following the 2003 wildfire.

Long-term sampling conducted at times between 1986 and 2006 on streams such as Poorman Creek, Arrastra Creek, Hogum Creek, Beaver Creek, Dry Creek, and reaches of the Blackfoot River suggests that the quality of spawning gravels has not declined based on statistical significance levels of 90% (Burns 2006). Streams such as West and East Forks of Cabin Gulch as well as Magpie Creek are streams with substantial human disturbance in them, which suggest a trend toward higher levels of sediment levels as compared to a stream like Beaver Creek north of Nelson Montana, which has a similar geology and less overall human disturbance. Sediment findings from Beaver Creek are not included in 2005 results as it was evaluated in earlier years. Sediment information on Beaver Creek is located in the project file.

Over the long-term, sediment sampling findings from 1986-2005 has shown that there is wide variation in sediment levels within streams throughout the Forest. Variability can be high on different reaches of the same stream while for other streams variability associated with different sites on the same stream is much less. Even within the same reach of a single stream variation in fine sediments from stream gravels can be substantial and an increased level of sampling is likely needed in order to determine if there actually has been a change that is statistically significant at the 90% confidence level.

However, when all the information is pooled together for streams of differing geologies the mean value of sediment present in the spawning gravel has not been found to be statistically different as compared to the mean sediment level for most of the individual geologies. This is an important finding as by pooling all core sample information, a more rigorous statistical analysis can be conducted to assess whether changes on any particular stream has occurred.

*Actions in response to variability assessment:*

Although statistical changes in sediment levels cannot be demonstrated within spawning gravels at the 90% confidence level in most cases, earlier Helena Forest Fishery Monitoring Reports discussed that sediment levels in some streams indicated that there were elevated levels of sediments in managed drainages as compared to unmanaged drainages. The recommendation from these earlier monitoring reports was that a Forest Plan amendment be developed that included standards for sediment levels in spawning gravels. The Forest did not develop a Forest Plan amendment to address the sediment issue, but did adopt a strategy that substantial ground disturbing management actions proposed in various drainages will include actions that focus on reducing sediment production from existing levels or at least have no net increase in sediment delivery from existing levels. Although not a formalized strategy the approach was used as part of the Beaver Dry Timbersale, the Poorman Timber Sale, the Draft EIS on the Nevada/Dalton Project, Snow-Talon Salvage Sale, Elliston Fuels Treatment Project, and the Cabin Gulch Draft EIS. The approach is aimed at meeting or exceeding the Forest Plan Standard for General Watershed Guidance #4 (Helena Forest Plan pg II-35). Sediment levels in several of the streams in the above mentioned project areas have been monitored over time and as is discussed in the monitoring results, statistical changes in sediment levels have not been able to be demonstrated.

**Recommended Efforts:**

Monitoring of sediment levels in salmonid spawning substrates is a useful element to continue, but it is very difficult to show statistical significance in many streams as a function of management activities due to high natural variation of sediment levels in stream gravel substrates. There should be additional follow-up efforts over the next several years to collect substrate sediment levels in streams where data was only collected in one year as well as continuing to collect sediment information from several streams where a solid baseline of sediment information has been collected and we have conducted ground disturbing management activities. The sediment information provides quantitative data that helps assess the degree to which changes are or are not occurring in the various drainages where management activities have taken place. Sediment sampling of spawning gravels is valid for showing trends and for defining existing conditions in watersheds in relation to the level of management activities and/or natural events that have occurred. The trend data from information collected throughout the Forest since 1986 suggests that fisheries concerns over higher sediment levels present in drainages having high road densities are

supportable and that efforts to decrease or at least assure no elevations from current sediment delivery levels are worthwhile. Long-term trend data is also very useful, especially in important fishery streams to establish bounds on the level of natural variability for sediment levels in stream spawning substrates; both for streams having high levels of human disturbance as well as streams that having low levels of human disturbance.

## (C12) Streamside Cover for Fish

### Forest Plan Requirements:

To assure management activities do not degrade the habitat of riparian dependent species, monitoring is conducted to assess streamside cover for fish, forage utilization, streambank trampling, plant and animal communities. Project environmental assessments, habitat transect sampling, allotment inspections, utilization studies, inspection of canopy and understory vegetation, watershed inventory and monitoring plans, and timber sale contracts are to be used as data sources. Annual inspections after livestock are removed and five transects per section are to be used to detect declines in habitat suitability.

#### *Intent:*

The intent of the requirement is to assure management activities do not degrade the habitat of riparian dependent species. 1. Shading for streams, 2. fish habitat, 3. song bird habitat, 4. forage and browse and 5. diversity

The Forest Plan included the following riparian standards for livestock grazing:

#### Continuous Grazing System

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Grass / grasslike / forb Communities	40	20

#### Utilization for Deferred Rotation System

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Grass / grasslike / forb Communities	50	35

#### Utilization for Rest Rotation System

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Willow/grass/grasslike and Willow/forest Communities	60	40

The "early" pasture is the pasture(s) used first and/or until approximately August 1. The "late" pasture is the pasture(s) used after this date.

Riparian utilization level standards that are added to new allotment management plans are based on the following guidelines rather than the Forest Plan guidelines. The intent of these guidelines is to maintain or move toward proper functioning condition and then to strive for and maintain the similarity level that best meets the integrated desired conditions. The values in the following two tables are intended to promote recovery toward sustainable healthy, diverse and fully functional riparian systems or to maintain such conditions if in high similarity. Parameter values may be chosen to provide recovery within a specified timeframe, i.e. rapid recovery (5-15 years) or moderate recovery (15-30 years). The values for rapid recovery may be used for a particular stream if, for example, it is critical in meeting scenery value objectives, providing habitat for westslope cutthroat trout, or meeting some other resource value.

<b>Annual Riparian Zone Key Species Forage Utilization (percent by weight) Early Grazing/Late Grazing</b>									
Rapid Recovery					Moderate Recovery				
	Functionality/Similarity					Functionality/Similarity			
Resiliency	FC/High	FC/Mod	AR/Mod	AR/Low	Resiliency	FC/High	FC/Mod	AR/Mod	FAR/Low
High	60/40	50/30	40/30	40/30	High	60/40	60/40	50/40	40/30
Moderate	50/30	40/30	40/20	40/20	Moderate	50/30	50/30	50/30	40/30
Low	40/20	30/20	20/20	20/20	Low	40/20	40/20	30/20	30/20
Key species to be monitored will be identified based on timing of use and/or palatability.									

<b>Annual Flood Plain Soil Disturbance (percent) Early Grazing/Late Grazing</b>					
Rapid Recovery			Moderate Recovery		
	Functionality/Similarity			Functionality/Similarity	
Resiliency	FAR/Low	NF/Low	Resiliency	FAR/Low	NF/Low
High	20/15	15/10	High	30/20	20/15
Moderate	15/10	10/5	Moderate	25/15	15/10
Low	5	5	Low	10	10

#### Data Sources:

Specific data sources recommended in the Forest Plan for this element include: Project EA's, habitat sampling by transects; allotment inspections; utilization studies; inspection of canopy and understory re-vegetation; watershed inventory and monitoring plan; timber sale contracts; information from 25, 1000 foot sections.

From a fisheries perspective, the Cowfish Methodology (1985) was originally specified as a means to assess riparian conditions. This method has not been used since 1992 and beginning in 1998 the Helena Forest adopted methods that are more widely accepted. These newer methodologies/information bases used to assess riparian habitats include: 1) Implementation Monitoring Module Results from Interagency Implementation Team (IIT) Monitoring Protocol on grazing allotments west of the continental divide and 2) Bull trout Level 1 Team Monitoring Findings on four livestock allotments west of the continental divide. Additional data sources include biological assessments, biological evaluations, fishery effects analyses conducted on four allotment updates in 2005, general fishery reviews conducted on several ongoing allotments, proper functioning condition assessments, allotment utilization measurements, and riparian/migratory songbird assessments. Data for riparian songbird assessments are derived from the Avian Science Center Northern Region Landbird Program and are on file in the Supervisor's Office. These newer methodologies and evaluation approaches replace the transects and 1000 foot sections identified in the Forest Plan.

#### Current Efforts and Findings:

Presently monitoring of forage use on livestock allotments west of the continental divide is conducted as part of implementation monitoring required by the U.S Fish and Wildlife Service biological opinion (USDI 1998 pgs 98-99) for bull trout completed on Forest Plans in Washington, Oregon, Idaho and Montana. Additional bank disturbance monitoring is conducted on specified stream reaches to address adverse

impacts to bull trout from livestock grazing on four allotments on the Helena Forest. The additional monitoring on these allotments is conducted as coordinated by the Bull Trout Level 1 Team (USDA 2005) and specified in the Terms and Conditions of the most recent Incidental Take Statement from re-initiation of the formal consultation completed for several livestock grazing allotments on the Helena Forest by the U. S. Fish and Wildlife Service (USDI 2002).

General fishery evaluations associated with updates to four allotments east of the continental divide (Frohner, Big Buffalo, Little Buffalo, and Quartz/Rowe) were completed in 2005. Additionally, general fishery reviews of ongoing grazing activities on the Gurnett, Drumlummon, Clark Canyon, Baldy, Ophir/Hope, McQuithy, and Clancy Allotments were conducted.

The implementation monitoring efforts discussed above have shown that the Forest has met stubble height requirements on allotments west of the continental divide with one exception. The bank disturbance monitoring has also indicated that bank disturbance levels are being met on specific transects monitored on 4 allotments west of the continental divide with one exception, the Blossburg allotment. However, additional fishery spot evaluations of other locations on various allotments indicated that bank disturbance was exceeded on some reaches of Meadow Creek on the Blossburg Allotment, Hope Creek on the Ophir/Hope Allotment, and Spring Gulch on the Spring Gulch Allotment.

In 2001, the Avian Science Center and the Forest Service, as part of the Northern Region Landbird Program, initiated a study designed to determine effects of grazing on riparian willow communities and their associated avian species. This was a two year study conducted in 2001 and 2003. Data have recently been analyzed and are in preparation for publication. A synopsis of those data is presented here.

*Documentation and monitoring methodology:*

Monitoring to meet the Terms and Conditions (USDI 1998 pages 98-99) of the U.S Fish and Wildlife Service 1998 Bull Trout Biological Opinion is being conducted as directed by the Implementation and Monitoring Team using regional protocol (protocol available through the Pacfish/infish Special Project Section on the Rocky Mountain Research Station Website). For grazing, use of residual stubble height of vegetation on the greenline is the minimum monitoring element. The greenline is the area along a riparian area where there is a change in vegetation due to the influence of water. Greenline is further described in the Implementation Monitoring Protocol at the Rocky Mountain Research Website detailed above. For the Helena Forest the minimum stubble height on the greenline is currently established at 6 inches. Additionally, monitoring to meet the Terms and Conditions of a 1999 Biological Opinion for several grazing allotments on the Helena Forest focuses on bank disturbance monitoring. The monitoring to meet the intent of the site specific Biological Opinion utilizes a pace transect measurement to determine the percentage of streambank that has been disturbed by livestock on the specific transect in any given year. The protocol for the bank disturbance transect work to meet the terms and conditions of the biological opinion has been jointly coordinated between Bull Trout Level 1 Team Members, Forest Service Range Personnel, and allotment permittees as is mentioned in USDA (2004) and USDA (2005). A newer approach to provide for consistent bank disturbance measurement across Region 1 is currently in a draft stage and will likely be used on grazing allotments on the Helena Forest beginning in 2006. Bank disturbance levels are not to exceed 20% on most sites. Sites monitored in 2005 are detailed in a summary report to the US Fish and Wildlife Service (USDA 2005).

Proper Functioning Condition ((PFC) Survey - The approach used is documented in (USDI/ USDA 1998) which can be found in the project file.

Biological Assessment - A standardized format for the biological assessment on bull trout is used for proposed activities as agreed to by the Montana Bull Trout Level 1 Team (attachment A). Streams

reaches are visually inspected by professional fishery personnel with findings documented as part of the various "matrix" elements (USDI 1998) in the Biological Assessment. Documentation of the assessment and rationale for the effects analysis are detailed in specific assessments that are part of project files on individual grazing allotments as well as other actions that may have an effect on bull trout. One of the key components of the Biological Analysis is the watershed baseline. The watershed baselines establish overall condition for each of the 6<sup>th</sup> code hydrologic units in the Upper Clark Fork USDA (2000a) and Blackfoot (USDA 2000b) Bull Trout Section 7 Watersheds. These documents are also part of the project file.

**Biological Evaluation** - This process is very similar to what is discussed above for bull trout biological assessments but is done for westslope cutthroat trout. West of the continental divide the watershed baseline population and habitat parameters are adjusted to reflect westslope cutthroat trout rather than bull trout. The same format is used to assess risk to cutthroat trout west of the divide as is used for the biological assessment. However, east of the continental divide watershed baselines have not been completed to the level of detail as has been accomplished for streams west of the continental divide. Consequently the format for biological evaluations conducted east of the continental divide do not follow the format used west of the continental divide.

**General Fishery Evaluation.** For proposed activities a no effect checklist (Attachment B) is used as a guide for evaluating risk to listed fish species (bull trout), sensitive fish species (westslope cutthroat trout) and other fish species present on the forest. Rationale for conclusions reached are included in the documentation section of each effects analysis. Review of ongoing livestock grazing activities is accomplished using general walk through consisting of visual evaluations of streamside forage use and stream bank disturbance with notation documented in regard to streamside forage use, bank disturbance levels, and effect to fishery resources. Documentation of concerns is generally available via fishery files and may consist of field notes as well as e-mails to other forest personnel discussing concerns on the allotment.

#### Utilization Methodology

According to the Range Analysis Handbook (R-1 FSH 2209.21 4/77 AMEND 21, pg. 421-424-1) utilization can be monitored by ocular estimates, grazed plant, grazed loop methods and clipped-weight methods. The method used to determine utilization for 2005 were ocular estimate by percent, paced transects and measured.

#### Ocular –

The ocular estimate requires conscientious training and application. It is based on estimating the percent of use on a small sample plot. For training, clip a hoop to simulate grazing and retain clippings. Estimate percent removal and clip remainder of plot. Weigh both lots of herbage, determine percent removal and compare against estimates. Varying degrees of utilization can be recognized by a series of estimates and checks. Two paced transects should be located in one habitat type or site. Ten hoop plots at 1-chain intervals (can be shorter in smaller areas) per transects by pacing. Estimate percent removal per plot and record on form.

#### Paced –

Paced transects do not require much training. It is based on the relationship between the percent of the plants grazed and the percent used. This is a good method for bunchgrass ranges. This method is used on representative areas, with a 50 plant interval. Tally grazed and ungrazed plants at predetermined intervals along a transect. The length of the transect determines the intervals. To determine the percent, it is compared with various charts with specific bunchgrass species. This chart also helps determine the percent weight utilization.

Measured –

The Helena National Forest adopted the Monitoring for Success book in conjunction with the Range Analysis Handbook for measuring utilization and actual stubble height. Paced transects are used to measure both utilization and stubble height. For utilization, a maximum of a 50 pace transect is determined in a representative area of bunchgrasses. Percent of the plant that has been grazed is compared with diagrams of how bunchgrasses are typically grazed and the percent is recorded on a form. Once 50 paces are completed, the columns with the percent are added up and divided by the number of paces completed. This determines the total utilization of bunchgrasses in an area. This method can be isolated to specific bunchgrasses to help determine how livestock are grazing specific species. Stubble height is similar but is usually used on sod forming grass species. This method determines the amount of stubble left on site. This method is useful in riparian areas where a certain stubble height is necessary to meet riparian objectives for other dependent species.

Riparian Songbird Assessment – Methodologies are described in the “Structure and Grazing in Tall Willow Riparian Communities East Side Forests” report.

***Monitoring Activity:***

*Shading of Streams and Fish Habitat*

Grass stubble heights are measured along the greenline of riparian areas on most allotments west of the continental divide. On most of the transects, a 6 inch stubble height for sedges is used.

Streambank disturbance is measured on several transects for the Blossburg, Spring Gulch, Hat Creek and Ophir/Hope Allotments.

General fishery reviews conducted on Gurnett, Drumlummon, Clark Canyon, Ophir Hope, Baldy, McQuithy, and Clancy Allotments were conducted.

*Livestock Utilization Monitoring*

Livestock forage utilization was measured on thirty-one streams, within twenty-one allotments. The following table shows riparian monitoring that was completed in 2005 using paced transects.

<b>Allotment</b>	<b>Grazing System</b>	<b>Riparian Area</b>	<b>% Utilization</b>	<b>% Browse</b>	<b>% Streambank Trampling</b>
South Crow	Deferred Rest	Jenkins Gulch	48**		80***
		S. Fork of Crow Ck	44**		
Camas Creek	Deferred Rest	Little Camas Creek	65**		
Alice Creek	Deferred Rest	Upper	15		20
		Middle	0		5
		Lower	0		5
Chimney Creek	Deferred Rest	Chimney	0		14
East Nevada	Continuous	Nevada	10		9
		Jefferson	10		15
Gould	Continuous	Gould			15
Horsefly	Deferred Rest	Horsefly			14
Moose Creek	Rest Rotation	Moose	0		7

Allotment	Grazing System	Riparian Area	% Utilization	% Browse	% Streambank Trampling
		Wasson	0		8
Stonewall	Continuous	Beaver	0		16
Shinglemill	Continuous	Shingle Mill	0		10
Tarhead	Continuous	Tarhead			18
Willow Creek	Continuous	Willow	10		12
Big Buffalo	Deferred Rest	Buffalo Creek	35		10
		Corral Gulch	15		10
Blossburg	Deferred Rest	Dog Creek	50**		47***
Drumlummon	Rest Rotation	Skelly Gulch	35		
East West French	Rest Rotation	East West French	38		
		French Creek	20		10
Grouse Ridge	Deferred Rest	Bowman	30		10
		Fantail	25		10
		Trout	20		10
Hat Creek	Deferred Rest	Hat Creek	13		12
		Behind Kading			11
Indian Flats	Deferred Rest	Pikes Gulch	30		10
		Indian Creek	25		10
Jim Ball	Deferred Rest	Pikes Gulch	15		10
Little Buffalo	Rest Rotation	Go Devil	60**		20
McClellan	Deferred Rest	Miller Creek	43**		
		Crystal	43**		
Maupin	Rest Rotation	Maupin Creek	33		15
		Willard Creek	40		15
Nelson/Favorite/York	Deferred Rest	Cottonwood Gulch	58**		10
		Bull Run	15		
Ophir Hope	Continuous	N. Fork Ophir Creek			5
		Hope Creek		10	12
Quartz Rowe	Deferred Rest	South Fork Quartz Creek	10		10
Slate Lake	Deferred Rest	Elliston Creek		15	75***
		Slate Creek			5
		Hurd Creek			16
Spotted Dog	Deferred Rest	Spotted Dog Creek	21		10
Spring Gulch	Continuous	Spring Gulch			15

\*\* Exceeded Forest Plan standards

\*\*\* Exceeded Handbook standards

### *Riparian Songbird Assessment*

The goal of the "Structure and Grazing in Tall Willow Riparian Communities East Side Forests" study was to collect and develop information on avian species responses to riparian conditions. Riparian zones constitute a small percentage of western landscapes while providing habitat for several avian species. Riparian areas are also amongst the most modified land types in the west (Chaney et al. 1990<sup>2</sup>). Grazing has been identified as the major factor affecting wildlife habitat productivity in the western U.S. (Kauffman and Krueger 1984<sup>3</sup>). Tall-willow community types are important avian habitat on east-side forests. Moderate and heavy grazing has created change in shrub structure in a significant proportion of this community type. Specific objectives included:

- Determine the effects on bird community composition and individual species abundance from vegetative changes due to variable-level cattle grazing and browsing in tall-willow riparian areas.
- Determine the relationship of vegetative physical structure, components, and plant species composition to bird abundances within and among low-, medium-, and high-structured tall-willow riparian areas.
- Conduct vegetative sampling to compare structure and components among treatment types.

Study sites were located in willow community and habitat types dominated by tall (>2 m) species of willow. Study sites were located at low to mid elevations within coniferous forests and were at least 0.75 mi long (in order to contain at least 5 bird counting points).

Grazed and ungrazed tall-willow riparian sites were categorized based upon the degree of physical evidence of grazing at the site. Selection criteria used included trails and the severity of trampling, as well as grazing and browsing evidence in streamside areas.

A 10-minute bird point count was conducted at each of the sampling points in a site. Points were visited three times during the breeding season from mid-May to early July. All birds seen or heard within the count period are recorded. Point counts were conducted from the third week of May through the second week of July, in the first five hours after sunrise, and not when there continuous rain or high winds.

#### *Data Analysis Methods:*

Monitoring methods are aimed at determining if effects to fish habitat and other riparian dependent species have occurred. Measurement of forage stubble height can be used as a less costly measure to ensure bank disturbance levels are maintained to a specific standard rather than measuring bank disturbance directly. However, until relationships are better established it is currently assumed that measuring bank disturbance directly is a more accurate means of assessing effects to fisheries than stubble height of forage. Analysis is conducted in terms of whether greenline forage stubble height requirements were maintained and bank disturbance requirements were maintained. On allotments where general fishery reviews were completed analysis is conducted in relation to the degree that streamside forage is maintained and the level of streambank disturbance.

Livestock utilization data were summarized from field observations and surveys.

Riparian Songbird Assessment – Data analysis for the "Structure and Grazing in Tall Willow Riparian Communities East Side Forests" study is summarized in that report.

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<sup>2</sup> Chaney, E.; W. Elmore; and W.S. Platts. 1990. Livestock grazing on western riparian areas. Produced for the Environmental Protection Agency by Northwest Resource Information Center, Inc., Eagle, ID.

<sup>3</sup> Kauffman, J.B., and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications: a review. *J. Range Manage.* 37(5):430-438

***Monitoring Results:***

Biological Opinion monitoring conducted west of the continental divide in 2005 has indicated that bank disturbance levels and stubble heights have been met on all established allotment transects monitored except on the Blossburg Allotment. Bank disturbance levels have been exceeded at times for one stream reach on the Blossburg Allotment, which is detailed in the 2005 allotment monitoring report to Fish and Wildlife Service (USDA 2006). The Helena Forest Fishery Biologist estimated that bank disturbance levels were well over 20% on key stream reaches within three other allotments west of the divide (Spring Gulch Allotment, portions of the Clark Canyon Allotment, and the Hope Creek portions of the Ophir Hope Allotment). The finding by the Forest Fishery Biologist is a portion of the general fishery review procedure and consisted of walk through visual reviews.

East of the continental divide general fishery surveys found that bank disturbance levels were very high on some stream reaches within the Gurnett Allotment with subsequent negative effects to fish habitat and likely direct mortality of fish eggs due to trampling of spawning sites by livestock. Livestock grazing was also found to be impacting fish habitat negatively via elevated bank disturbance or via elevated risk of westslope cutthroat trout egg/fry survival on some reaches of Kady Gulch, Clancy Creek and the South Fork of Quartz Creek in the Clancy Allotment, Skelly Gulch (Drumlummon Allotment), Ray Creek (Baldy Allotment), and the North Fork of Deep Creek (Ray Creek Allotment). Additional information can be found in the project file.

Biological evaluations, and fishery effects analyses on several other allotments (Frohner (Harper and Walch 2005a), Big Buffalo (Harper and Walch 2005b), Little Buffalo (Harper and Walch 2005c), and Quartz/Rowe (Harper and Walch 2005d), concluded that fish habitat has been affected by grazing to varying degrees, but effects were concluded to not have significant effects to the fish populations present. Where significance is defined as the level at which local fish population viability is at risk. Detailed information can be found in the project file.

Livestock Utilization - Of the thirty-one riparian areas where livestock grazing was monitored in 2005, eight riparian areas exceeded the standards identified in the Forest Plan. The assumption used is that the monitoring was completed for areas that were continuous, early season grazing.

Riparian Songbird Assessment – The following table summarizes transect data and number of bird species observed per transect for the “Structure and Grazing in Tall Willow Riparian Communities East Side Forests” study. These data are region-wide. Forest-wide data have not been split out because of small sample size. This applies to all the data summarized below.

<b>Summary of transect results for the riparian willow study</b>					
Quad	Transect #	# of Points	# of Visits	Treatment <sup>1</sup>	# of Bird Spp.
Whites City	1207	6	3	High	36
Six Mile Mountain	1201	7	3	High	33
Nelson	1203	8	3	High	48
Esmeralda Hill	1205	7	3	Moderate	34
Greenhorn Mountain	1208	6	3	Moderate	33
Bison Mountain	1209	8	4	Moderate	31
Giant Hill	1202	7	3	Moderate	27
Elliston	1206	7	3	Moderate	34
Whites City	1204	9	3	Low	26

<sup>1</sup>See report for treatment descriptions.

The following table summarizes bird species by treatment type.

<b>Summary of bird species (mean)<sup>1</sup> by treatment type</b>			
Species	Apparent Grazing Pressure		
	Low (N=14)	Moderate (N=12)	High (N=10)
Willow flycatcher	.24	.35	.19
Dusky flycatcher	.58	.64	.58
Warbling Vireo	.84	.43	.68
American robin	.77	1.04	.85
Gray catbird	.14	.00	.01
Yellow warbler	1.30	1.46	.44
Northern waterthrush	.09	.01	.03
MacGillivray's warbler	.41	.13	.41
Common yellowthroat	.54	.25	.21
Wilson's warbler	.21	.12	.02
Song sparrow	.77	.44	.31
Lincoln's sparrow	.62	.76	.92
White-crowned sparrow	.13	.53	.12
Lazuli bunting	.09	.03	.07
Brown-headed cowbird	.34	.55	.35

<sup>1</sup>See data results in project file for standard error.

No conclusions are available at this time since these data are in preparation for publication. Conclusions will be reported in out-year monitoring reports as they become available.

#### Variability Measure Discussion:

##### *Variability Measure:*

Decline in habitat suitability index (HSI) from present as measured by Cowfish Model (90% confidence) or a HSI of less than 0.6 as measured by Cowfish. Since Cowfish is no longer a monitoring tool, this variability measure is no longer pertinent.

As a substitute for Cowfish and HIS, residual forage stubble height is used along the greenline as a measurement tool on bull trout allotments. The stubble height must remain greater than 6 inches on 100% of the bull trout allotments to meet guidance. This requirement is aimed at maintaining adequate streamside shading and minimizing risk for bank disturbance to exceed 20% on sensitive stream channels. Stream bank disturbance levels are to be maintained at or below 20% on specified stream reaches west of the continental divide. Bank disturbance levels are set at this level by the Bull Trout level 1 Team on specified stream reaches to ensure that effects to fish habitat do not become significant.

Paced transects are used for both the stubble height and bank disturbance measurements on selected transects for portions of allotments where livestock grazing has potential to affect bull trout habitat. On

other allotments without bull trout issues, assessments as to whether Helena Forest Riparian Guidelines (USDA 1998) are being met are used as a means of assessing whether the Forest-wide riparian standards outlined in the Helena Forest Plan (pgs II-35-36) are being met.

Riparian Songbird Assessment – There are no between year variability measures associated with the “Structure and Grazing in Tall Willow Riparian Communities East Side Forests” study at this time.

***Assessment:***

Findings from stubble height monitoring, bank disturbance monitoring, the various biological evaluations conducted during grazing allotment updates, and general fishery reviews on other grazing allotments indicate that fish habitat and fish populations continue to be affected to varying degrees on a number of grazing allotments across the Forest. Effects vary from minor to adverse.

Findings from the Implementation Grazing Monitoring for bull trout west of the continental divide indicates that although stubble height requirements are being met, the bank disturbance level on some stream reaches continue to be exceeded on the Blossburg grazing allotment. Additionally, from the general fishery review conducted on other portions of the Spring Gulch, Clark Canyon and Blossburg allotments not evaluated via the Implementation Monitoring Module protocol, it appears that the 6 inch stubble height requirement along the greenline is not adequate to maintain 20% or less livestock trampling of streambanks on unfenced reaches where those unfenced reaches are highly susceptible to being damaged by livestock grazing.

There is no baseline information to compare the livestock grazing riparian monitoring to, outside of the above allotments. Of thirty-one streams measured, eight exceeded Forest Plan standards while twenty-three streams were within the standards. There is not enough information to determine whether conditions on the streams are deteriorating, based on the existing monitoring. The number of streams that exceed the standard indicates that close monitoring is needed in riparian areas to ensure that livestock grazing does not exceed Forest Plan standards.

***Actions in response to variability assessment:***

Recommendations to develop a Forest plan amendment to address effects of livestock were included in earlier fishery monitoring reports. In response the Helena Forest developed riparian guidelines (USDA 1998) to utilize as a means to achieve the Riparian Standards in the 1986 Forest Plan. The Forest continues use of the new guidelines under Helena Forest handbook direction as a means to meet the USDA (1998) riparian guidelines and Helena Forest Plan Riparian Standards. The effort is accomplished through direction provided to allotment permittees via grazing allotment annual operating plans or as part of the allotment management plan on newly completed allotment management plans. Consequently, at the present time there is no need to develop a forest plan amendment. Efforts will be continued by Forest personnel to help ensure impacts to riparian related resources remain at low levels by striving to implement the Helena Forest Riparian Guidelines (USDA 1998) within the various allotments.

Based on the finding that bank disturbance levels on one of the very important reaches of Dog Creek in the Blossburg Allotment occurred, meetings were planned with the Fish and Wildlife Service to determine what action needed to be taken in 2006 to reduce risk for exceeding bank disturbance standards in 2006. The conclusion from meetings between the Helena Forest and Fish and Wildlife Service Bull Trout Level 1 personnel was that additional efforts such as more intensive control of livestock by riders should be undertaken in 2006 to reduce impacts to the unfenced reach of Dog Creek. If those efforts were not successful in reducing effects in 2006, Bull Trout Level 1 members concluded that additional measures such as re-initiation of formal consultation may become necessary.

Due to impacts discussed earlier for a number of other allotments the following actions were taken: livestock grazing was not to occur on the riparian portion of an unnamed fork of Duck Creek (Gurnett Allotment) in 2006; a drift fence was to be constructed on Ray Creek (Baldy Allotment) in 2006; the grazing strategy for Clark Canyon was to be adjusted somewhat to reduce streambank disturbance; a riparian enclosure was to be constructed on the North Fork of Deep Creek (Ray Creek Allotment) in 2006; and assessments will be undertaken by range and fishery personnel to reduce problems on Skelly Gulch, and Spring Gulch in 2006. Additionally, further review of fishery concerns on Clancy Creek and Kady Gulch on the Clancy Allotment should take place to better evaluate the effects of livestock grazing on fisheries and develop proposals to reduce effects to fish habitat from livestock if needed.

In addition to the efforts to implement the Helena Forest riparian guidelines and other actions discussed above, a number of riparian areas have been fenced over the last 15 years to exclude livestock use from riparian areas with the intent to improve cover and reduce bank disturbance from livestock trampling. Maintenance of these enclosures is needed on a yearly basis. Enclosures have been constructed on portions of Elliston Creek, Snowshoe Creek, Pikes Gulch, Trout Creek, Meadow Creek, Uncle George Creek, Dog Creek, Jenkins Gulch and Eagle Creek. Enclosures on Jenkins Gulch and Pikes Gulch are no longer in place. Additionally, off-stream water developments have been developed on several allotments to draw livestock away from riparian areas: Blossburg Allotment (two developments) Slate Lake Allotment (one development), Alice Creek Allotment (one development), Willow Creek Allotment (one development), and the West Nevada Allotment (one development).

Livestock were removed from pastures on approximately 3 allotments due to riparian use levels in 2005.

Riparian Songbird Assessment – Preliminary data indicate that several species of birds that are restricted to willow riparian habitats avoid areas of heavy willow grazing. These species include but are not limited to the willow flycatcher, the song sparrow, and the common yellowthroat. Other species such as the dusky flycatcher and the American robin have a wider tolerance for grazed willow communities. As data are summarized and published, more information will be presented on the effects of willow grazing on avian communities.

Riparian Songbird Assessment – There are no actions in response to a variability assessment associated with the “Structure and Grazing in Tall Willow Riparian Communities East Side Forests” study.

#### **Recommended Efforts:**

More attention needs to be directed toward moving livestock out of pastures in a timely fashion so that the bank disturbance guideline is not exceeded on stream reaches highly susceptible to being damaged by livestock grazing. To ensure livestock are moved prior to bank disturbance levels being exceeded, additional review of riparian habitats is needed on many allotments. Based on current information, specific efforts to further reduce bank trampling and potential effects to fish habitat by livestock on various stream reaches should be undertaken. Stream reaches where bank disturbance by livestock should be reduced on some reaches to meet riparian guidelines include: 1) portions of Dog and Meadow Creeks (Blossburg allotment), 2) Spring Gulch (Spring Gulch Allotment), 3) Skelly Gulch (Drumlummon Allotment), 4) Fork of Duck Creek (Gurnett Allotment), 5) Clark Canyon Creek (Clark Canyon Allotment), 6) Clancy Creek and Kady Gulch (Clancy allotment), and the North Fork of Deep Creek (Ray Creek Allotment). Permittees need to be notified well in advance of any exceedance in bank disturbance levels so that they can move livestock in a timely fashion so that bank disturbance levels are not exceeded.

For the Fork of Duck Creek (Gurnett Allotment) mentioned above, exclusion of livestock is recommended for the reach critical to westslope cutthroat trout egg survival. Exclusion of livestock will substantially improve survival chances for this marginally viable local population. On a reach of Spring Gulch (Spring

Gulch Allotment) where the local westslope cutthroat trout population viability is substantially at risk due likely in part to livestock trampling of westslope cutthroat trout eggs and young of the year, some means of reducing livestock should be undertaken in 2006.

Bull Trout Level 1 monitoring requirements on livestock allotments having formal consultation, riparian condition surveys using the Proper Functioning Condition Concept, evaluation of fish habitats through biological evaluations, biological assessments, and continued range utilization studies ( Forest Plan Range Monitoring D elements ) should all be continued. From a fisheries perspective, continuation of monitoring to determine bank disturbance levels associated with the adverse allotment monitoring is an important element to continue. As discussed above there are numerous reaches of fishery streams that need additional protection from livestock impacts. Based on efforts in other locations of the forest, riparian fencing has proven to be very effective in reducing bank disturbance on the sites highly susceptible to being damaged by livestock.

All livestock enclosures need to be reviewed yearly and maintained if needed.

For streams east of the continental divide on the Helena Forest in the Upper Missouri, Boulder, Smith, and Dearborn 4<sup>th</sup> code hydrologic units it would be useful to establish watershed baseline conditions using the same established protocol within each sixth code hydrologic unit as has been done for streams west of the continental divide. The baselines provide a comprehensive and standardized means to document existing conditions within a 6<sup>th</sup> code hydrologic unit that is based on all past and ongoing activities. These baselines that have been completed west of the continental divide have proven to be very helpful in conducting cumulative effect analyses.

Riparian Songbird Assessment – Continue monitoring avifauna in riparian habitats per long-term trend monitoring established for the Northern Region Landbird Monitoring Program.

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### **(C13) Aquatic Invertebrate Populations**

#### **Forest Plan Requirements:**

Aquatic invertebrate populations are to be evaluated by collecting samples across the forest on the same reaches where sediment sampling (Element C11) is conducted.

#### *Intent*

The intent of this requirement is to assure that no impact is occurring to fish populations by using aquatic invertebrates as a surrogate measure for impacts to fish.

#### **Data Sources:**

Invertebrate collections from thirty 1000 foot stream reaches (6 samples per reach from the same reaches sampled under Element C11).

#### **Current Efforts and Findings:**

During 2005 aquatic invertebrates were collected on four streams by the Helena Youth Forest Monitoring Group. Based on analysis procedures of the invertebrates water quality was rated to be good.

#### *Documentation of monitoring methodology:*

The Forest Plan calls for an assessment of aquatic invertebrates using the Biotic Condition Index or BCI (Winget and Mangum 1979 pages 1-13). The protocol to collect adequate samples of aquatic invertebrates to determine the BCI requires use of modified surber nets Winget and Mangum 1979 page

23). However, sampling conducted by the Forest Youth Monitoring Group from the Helena Forest used an abbreviated approach for collecting and analyzing samples; using a Diversity Index Value and Pollution Tolerance Index as measures of water quality. Sampling for 2005 included a single collection of aquatic invertebrates from two streams and sorting of the organisms to the broad classification category of order such as flies/midges (dipetera), caddis flies (trichoptera), stoneflies (plecoptera), mayflies (ephemeroptera), beetles (coleoptera) aquatic worms (oligochaeta), alderflies (neuroptera), snails (gastropoda), and leeches.

***Monitoring Activity:***

Single samples collected from four streams.

***Data Analysis Methods:***

Data is to be analyzed using the Biotic Condition Index or BCI (Winget and Mangum 1979 page 23). However, for 2005 an abbreviated method entailing calculation of a Diversity Index Value and Pollution Tolerance Index Value was used (see project file information for details on calculation of the Diversity Index Value and the Pollution Tolerance Index Value).

***Monitoring Results:***

<b>Stream Name</b>	<b>Aquatic Invertebrates Present (classed to order)</b>	<b>Diversity Index Value</b>	<b>Pollution Tolerance Index</b>
Slim Sam Creek	Stoneflies, caddis flies, mayflies, midges, worms	1.25	2.5 (good rating)
Roberts Creek	Stoneflies, caddis flies, mayflies, midges, worms	-0.1	2.43 (good rating)
Copper Creek	Stoneflies, caddis flies, mayflies, midges,	----	2.2 (good rating)
Sucker Creek	Stoneflies, caddis flies, mayflies, midges, beatles,leeches	-----	2.5 (good rating)

**Variability Measure Discussion:**

***Variability Measure:***

Currently stated as annual decrease from present in Biotic Condition Index (90% confidence). The very limited data from 2005 is not adequate to make any conclusion as to whether there is or is not a change in the BCI.

***Assessment:***

There is continued emphasis to utilize aquatic invertebrates by various federal and state agencies as well as universities as a means to assess effects to fish from a variety of factors. Aquatic invertebrate monitoring is certainly a tool that can be very useful for detecting effects to fisheries in certain circumstances (U.S. Environmental Protection Agency 1991, pgs 147-151). Examples include situations when there is likely risk of nutrient enrichment or influx of mine effluent into streams. Utility for detecting effects to fish due to sediment increases is low relative to cost; especially when the amounts of sediment delivered are likely to be relatively low. The low utility is due to high variability in sediment levels throughout streams on the forest (see discussion for element C-11 earlier) and variability in the invertebrate populations that is known to generally occur throughout the summer period. Statistical differences in the Biotic Condition Index are likely to be detected at the 90% confidence level as a function of sediment changes only when there are large changes in sediment levels. Use of the broader

pollution tolerance index and diversity index values are even less likely to be able to detect subtle changes in aquatic invertebrates associated with minor changes in sediment delivery. In the scenario where sediment increases are likely to be low, but pervasive over time, it may be more cost effective to monitor sediment directly. See element C-11 above for discussion of how sediment varies in drainages with more human disturbance compared to ones with less disturbance.

*Actions in response to variability assessment:*

No action needed as findings are not adequate to state whether change has occurred or not. See recommended efforts below for discussion in relation to aspects in the assessment section above.

**Recommended Efforts:**

Aquatic invertebrate population data are of limited utility for determining effects to fish from sediment related effects, except when sediment levels have increased greatly such as when intense rain events follow wildfire events or in low gradient streams where sediment has increased greatly from a management activity such as livestock grazing. Data is expensive to collect and analyze, and data analysis is unlikely to detect changes on projects where minor changes in sediment delivery occur. The probable inability to detect change is due to the variation in both the invertebrate populations year to year and even within a season as well as the variations in sediment levels that occur naturally in both managed and unmanaged watersheds. Aquatic invertebrate monitoring is useful in other instances where substantial changes in water quality (even when the change might be of short duration) are possible; including chemical pollution of some kind such as from mine effluent or nutrient enrichment or a drastic change in sediment levels due to habitat degradation.

Maintain this element as a monitoring tool for assessing the effects for new activities that have substantial potential to affect water chemistry through chemical pollution such as mine waste or nutrient enrichment. Using aquatic macro invertebrates is likely a useful tool to use to monitor for effects to fish on various livestock grazing allotments, but due to high cost it is likely more effective to assess effects of livestock grazing to fisheries through evaluation of grazing on streamside vegetation and streambank disturbance levels (see element C-12 above). The less intense monitoring aquatic macroinvertebrates currently conducted by the Helena Forest Youth Monitoring Group is also a useful to continue as the findings are of some value for establishing a very broad baseline condition of aquatic invertebrates present in selected streams. Broad level baseline information is useful in describing biologic resources present in streams prior to conducting forest management activities.

Importantly, the forest plan requirement for the C-13 element should be restated such that it would require sampling in situations where either chemical changes from mine waste or nutrient enrichment are possible; not tied to sediment sampling sites associated with Monitoring Element C-11. Further, the variability factor that would stimulate action as currently cited in the Forest Plan C13 Monitoring Element should be restated to address site-specific conditions rather than inferring changes on a Forest wide basis. The changes could be done via an amendment or when forest plan revision occurs.

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## **(D) Range/Timber, Range, Range/Road Maintenance/Timber**

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### **(D1.1) Utilization of Forage in Transitory Range**

**Forest Plan Requirements:**

Monitor utilization of forage in transitory range

*Intent*

Determine correlation between level of forage utilization and mechanical damage to seedlings.

**Data Sources:**

Range inspections, forage utilization exams, regeneration surveys, FSVEG database information, and 22 transects

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Regeneration surveys are conducted according to FSM Sivicultural Practices 2409.17.

*Monitoring Activity:*

The Deep Creek, Grassy Mountain and Magpie allotments have had harvest from the Toston/Maudlow Fire Salvage, Cave Gulch Salvage within the last five years. Regeneration surveys have been conducted annually following harvest. The Snow Talon fire Salvage did not occur within any grazing lands.

The following timber sales were monitored in the past five years on the Forest:

<b>Allotment</b>	<b>Sale Area</b>	<b>Survey Year</b>	<b>Damage noted</b>
Deep Creek Grassy Mtn.	Toston/Maudlow Fire Salvage	2001-2005 ongoing	None Reported
Magpie	Cave Gulch Fire Salvage	2001-2005 ongoing	None Reported
	Snow Talon Fire Salvage	2004-2005	None Reported

*Data Analysis Methods:*

The surveys are observational data. The data are summarized in the FACTS database.

*Monitoring Results:*

FACTS reports based on the regeneration surveys indicate that no damage caused by livestock occurred to seedlings for the past five years.

**Variability Measure Discussion:***Variability Measure:*

95% +/- correlation between the level of utilization and plantation failure.

*Assessment:*

Survey data indicate that no plantation failure occurred due to livestock damage. This element is within the variability identified in the Forest Plan.

*Actions in response to variability assessment:*

No action is needed.

**Recommended Efforts:**

Continue to monitor this element. It is important to understand what impact, if any, livestock are having on plantations.

**(D1.2) Available Forage Utilized by Livestock****Forest Plan Requirements:**

Monitor percent of available forage utilized by livestock

***Intent***

Determine actual use by livestock and if utilization constraints of Forest Plan are met. The Forest Plan identified utilization standards for riparian areas as follows. These are listed in several of the permits that do not have current Allotment Management Plans and are used for upland monitoring as well as riparian:

**Continuous Grazing System**

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Grass / grasslike / forb Communities	40	20

**Utilization for Deferred Rotation System**

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Grass / grasslike / forb Communities	50	35

**Utilization for Rest Rotation System**

Dominant Vegetation	Early Pasture % Use	Late Pasture % Use
Willow / grass / grasslike and Willow / forest Communities	60	40

The "early" pasture is the pasture(s) used first and/or until approximately August 1. The "late" pasture is the pasture(s) used after this date.

The Forest-Wide standards of the Forest Plan states (11/22) Allowable forage utilization of these [key] plants should be based on local range conditions, soil stability, timing of use and known individual plant requirements. The guides for allowable utilization of key species, by condition classes, are in the Range Analysis Handbook (R-1 FSH 2209.21 4/77 AMEND 21, pg. 633-1). The following table is excerpted from the Handbook.

**Allowable Use Guides by Grazing System and Range Category**

Grazing System	Allowable use of Total Forage Produced High Good to Excellent Condition Class		Allowable Soil Disturbance or Recovery Criteria
	Dry Ranges	Moist Ranges	
	Mtn. Grassland, Palouse & mixed Grass Prairie Resettlement Range	Mountain Meadows, Bluegrass Bottoms	
Rest rotation	65% on heavy use pasture; 40% on light use pasture	Meadow 70% - Bluegrass 80% on heavy use pasture; 50% on light use pasture for both	Bare spots, tramped areas, and streambank damage caused during heavy use year should be healed or stabilized within the following rest

Grazing System	Allowable use of Total Forage Produced High Good to Excellent Condition Class		Allowable Soil Disturbance or Recovery Criteria
	Dry Ranges	Moist Ranges	
	Mtn. Grassland, Palouse & mixed Grass Prairie Resettlement Range	Mountain Meadows, Bluegrass Bottoms	
			period.
Deferred-Rotation	55% on heavy use pasture; 35% on light use pasture	65% on heavy use pasture; 45% on light use pasture	Disturbance areas on heavy use pasture should be stabilized or healed prior to use the following year.
Allowable Use on Key Areas by Condition Class			
Season long – Mid *Spring - Low Fall and Winter – High Rotation – Mid  Refers to allowable use recommended for condition class	Good – Excellent 40 – 50% Fair 25 – 40% Poor 10 – 25% Very Poor 0 – 10%	Good – Excellent 50- 60% Fair 30 – 50% Poor 15 - 30% Very Poor 0 – 15%	<b>20% Maximum Disturbance –</b> Moist ranges good – excellent condition on slopes 0-15%.  <b>15% Maximum Disturbance –</b> Fair condition moist ranges. Dry ranges – fair condition under 15% slopes, good or better condition 16-25% slopes.  <b>10% Maximum Disturbance –</b> Moist ranges in poor or lower condition. Dry ranges good-excellent condition 26-45% slopes, fair condition 16-25% slopes, and poor condition 0-15% slopes.

\* If use is concentrated in a short period, as a week or two, and substantial regrowth will result, allowable use can be increased to the high use recommended for the condition class. Significant regrowth seldom occurs on dry ranges after mid June in Region 1.

Allotment management plans that have been updated more recently have the following, more stringent utilization standards by “stand stage”. The stand stage process is described in “Methodology”.

### Stage Stand Allowable Utilization Levels Upland Utilization

Herbaceous Vegetation	Timing of Use <sup>1</sup>		Timing of Use <sup>2</sup>			Timing of Use <sup>3</sup>
	Early	Mid	Early	Mid	Late	Yearlong
Stage 1	50%	45%	60%	50%	40%	45%
Stage 2	45%	35%	50%	40%	30%	35%
Stage 3	35%	25%	35%	30%	25%	20%
Stage 4	0-5%	0-5%	0-5%	0-5%	0-5%	0-5%

<sup>1</sup> These levels assume that the area is used for only a portion of the year every year

<sup>2</sup> These levels assume that the area is used for only apportion of the year and NOT every year; ie. receives periodic rest.

<sup>3</sup> This level assumes that the area is used for the entire grazing season.

#### Data Sources:

Range inspection records, utilization studies, range analysis

#### Current Efforts and Findings:

All seventy-eight active allotments across the forest are categorized using A, B or C. These categories can change from year to year based on permittee compliance, AMP implementation or other factors such as unauthorized use. For "A" allotments (generally allotments that are continually in non-compliance, have T&E species that require a higher level of monitoring, AMP implementation or continual unauthorized use) a minimum mandatory documentation with Compliance Forms is required. "B" allotments (generally allotments that have been in non-compliance in the past but have changed management and are meeting standards or allotments that are borderline with compliance issues) will be administered to standard when "A" allotments have been taken care of. Allotment inspections will be documented in annual allotment diaries and may be summarized on Compliance Form. "C" allotments (generally allotments that have been in compliance, not stocked with livestock or don't have any major resource concerns, such as T&E species) will not be inspected unless all work is done on the A and B allotments.

#### *Documentation of monitoring methodology:*

##### Mapping methodology

The Region 1 rangeland data collection system from the mid-80's through the early 90's was collectively called ECODATA. Cover/frequency, line intercept and plant composition protocols were used throughout the Forest during that time. ECODATA has been replaced by the NRIS national database TERRA protocols which are very similar to ECODATA protocols. ECODATA legacy data has been "rolled over" into the TERRA system. The plot data were used to create the stand stage descriptions which are found in the project file. Stage 1 most closely resembles lightly grazed grasslands for a given habitat, while stage 4 is least like a lightly grazed grassland. The letter "I" signifies that a large amount of introduced grasses are present. Indicator plant species (plants such as rough fescue or Idaho fescue) and bare soil are key indicators of stand stage. This is an ocular mapping method, and a form is filled out for the polygon that is being mapped.

### Utilization Methodology

According to the Range Analysis Handbook (R-1 FSH 2209.21 4/77 AMEND 21, pg. 421-424-1) utilization can be monitored by ocular estimates, grazed plant, grazed loop methods and clipped-weight methods. The method used to determine utilization for 2005 were ocular estimate by percent, paced transects and measured.

#### Ocular –

The ocular estimate requires conscientious training and application. It is based on estimating the percent of use on a small sample plot. For training, clip a hoop to simulate grazing and retain clippings. Estimate percent removal and clip remainder of plot. Weigh both lots of herbage, determine percent removal and compare against estimates. Varying degrees of utilization can be recognized by a series of estimates and checks. Two paced transects should be located in one habitat type or site. Ten hoop plots at 1-chain intervals (can be shorter in smaller areas) per transects by pacing. Estimate percent removal per plot and record on form.

#### Paced –

Paced transects do not require much training. It is based on the relationship between the percent of the plants grazed and the percent used. This is a good method for bunchgrass ranges. This method is used on representative areas, with a 50 plant interval. Tally grazed and ungrazed plants at predetermined intervals along a transect. The length of the transect determines the intervals. To determine the percent, it is compared with various charts with specific bunchgrass species. This chart also helps determine the percent weight utilization.

#### Measured –

The Helena National Forest adopted the Monitoring for Success book in conjunction with the Range Analysis Handbook for measuring utilization and actual stubble height. Paced transects are used to measure both utilization and stubble height. For utilization, a maximum of a 50 pace transect is determined in a representative area of bunchgrasses. Percent of the plant that has been grazed is compared with diagrams of how bunchgrasses are typically grazed and the percent is recorded on a form. Once 50 paces are completed, the columns with the percent are added up and divided by the number of paces completed. This determines the total utilization of bunchgrasses in an area. This method can be isolated to specific bunchgrasses to help determine how livestock are grazing specific species. Stubble height is similar but is usually used on sod forming grass species. This method determines the amount of stubble left on site. This method is useful in riparian areas where a certain stubble height is necessary to meet riparian objectives for other dependent species.

#### *Monitoring Activity:*

Allotment Name	Ranking (A, B, C)	Timing of Use				Average Use %
		Early	Mid	Late	Continuous	
Blossburg	A	45	30	40		39
Cellar Ogilvie	A		35			35
Ophir Hope	A				5	5
Slate Lake	A			28		28
Spring Gulch	A				15	15
Alice Creek	A			30		30
Chimney Creek	A				32	32

Allotment Name	Ranking (A, B, C)	Timing of Use				Average Use %
		Early	Mid	Late	Continuous	
East Nevada	A				20	20
Moose Creek	A			28		28
Stonewall	A				42	42
West Nevada	A				10	10
Willow Creek	A				30	30
Diorite	A	31		27		29
South Crow	A				47	47
Pole Creek	A	22	19	16		19
Whitehorse	A	19	22			21
Camas Creek	A	31	19			25
Gurnett Creek	A		29			29
Baldy	A				10	10
Summary of "A" Allotments Monitored:	19	30	26	28	23	26
20 "A" Allotments total, 19 monitored:						
Big Buffalo	B	28				28
East West French	B	35				35
Grouse Ridge	B	25				25
Indian Flats	B	45				45
Jim Ball	B	60				60
McClellan	B	43				43
Maupin	B	35				35
Nelson Favorite York	B	30				30
Canyon Cr/Sandbar	B	25				25
Horsefly	B		35			35
Keep Cool	B	37				37
Marsh Creek	B				30	30
Shinglemill	B				35	35
East Pacific	B			35		35
Summary of "B" Allotments Monitored:	14	36	35	35	33	36
24 "B" Allotments total; 14 monitored.						
Little Buffalo	C	40				40
Gould	C				35	35
Tarhead	C				35	35

Allotment Name	Ranking (A, B, C)	Timing of Use				Average Use %
		Early	Mid	Late	Continuous	
North Beaver	C	23		25		24
Summary of "C" Allotments Monitored:	4	32		25	35	34
34 "C" Allotments total; 4 monitored.						

***Data Analysis Methods:***

Overall utilization was determined by taking the average utilization in each pasture monitored and dividing it by the number of monitoring transects. The average of 2004-2005 was then calculated. This value was compared with the Range Analysis Handbook (pg 633-1) guidelines based on grazing system and condition class. One basic assumption was that everything was in good to fair condition. The standards for continuous grazing are assumed to be early use in all allotments. All continuous use allotments have an early turn on date and are grazed until the end of the season or allowable use is met.

***Monitoring Results:***

Utilization was measured on thirty-nine of the seventy-eight active allotments on the forest in 2005 and thirty-four of the seventy-eight active allotments in 2004. Of the thirty-nine allotments monitored, 95% of the "A", 58% of the "B", and 12% of the "C" allotments were monitored. The remaining "B" and "C" allotments that were not monitored are allotments that generally are in non-use, in compliance or do not have major issues like T&E species. The average utilization for 2004 was 37% and in 2005 it was 30%. The average of the two years together was 34% and when compared with the 2005 average of 30%, there is a 4% difference.

The utilization constraints of the Forest Plan and FSM Range Analysis handbook actual use standards by livestock were met approximately on 92% of the thirty-nine allotments monitored in 2005.

**Variability Measure Discussion:**

***Variability Measure:***

+/- 10% variance from present over a sustained (3 yr) period.

***Assessment:***

As noted above, the variance for 2005 as compared to average of years 2004-2005 was 4%. This element was met for 2005 in the allotments monitored.

The variability measure for this element is difficult to interpret in a meaningful way. It appears that the comparison occurs between the current year's use and an average of the past three years. This element has not been assessed to the level of detail presented here in past reports. Only a two year period was provided for the 2005 report.

The intent of this element is clear—to measure forage utilization by livestock. That information is presented here, and a comparison of actual use to the Forest Plan standards is presented in the above table.

***Actions in response to variability assessment:***

No actions are necessary as the element is being monitored and is within the variability measure.

**Recommended Efforts:**

The element will continue to be monitored with an emphasis on the identified "A" allotments and if time permits the "B" and "C" allotments. All "B" and "C" allotments should be measured at least once every three years. All monitoring, including the permittees, should be inputted into the Rangeland INFRA monitoring section by pasture each year. This database would provide a historic look at monitoring on any key area, upland or riparian.

A more meaningful variability assessment for this element would be that 100% of the allotments are within the utilization standards specified in the allotment management plan, or the Forest Plan if a current allotment management plan doesn't exist. If an allotment is not in compliance over an averaged three year period, an action should be taken to assess the allotment and determine what action is needed to bring the grazing into compliance with the standard.

**(D2) Allotment Management Planning and Update****Forest Plan Requirements:**

Monitor allotment management planning and update.

***Intent:***

Insure allotment management plan updates occur at 15 year intervals, that plan is being adhered to, management objectives are being met and improvements are maintained. This is a five year average assessment.

**Data Sources:**

FSRAMIS (range inspection reports). This database has been replaced by the INFRA database. Environmental documents, specialist reports and allotment inspections have been used in assessing this element.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

This element is an assessment of the number of allotment management plants updated, averaged over a five year period. The past ten years of allotment planning are shown for context.

***Monitoring Activity:***

Allotment management plan updates for the past ten years were assessed as to the condition and trend of those allotments to assess this element.

DISTRICT	ALLOTMENT NAME	NEPA DECISION DATE
1	THOMAS CREEK	19-Dec-96
1	CEMENT GULCH	19-Dec-96
1	MULE CREEK	19-Dec-96
1	CAMAS CREEK	19-Dec-96
1	SPRING CREEK	19-Dec-96

<b>DISTRICT</b>	<b>ALLOTMENT NAME</b>	<b>NEPA DECISION DATE</b>
1	WATSON	19-Dec-96
1	SNEDAKER BASIN	19-Dec-96
1	WAGNER SNEDAKER	19-Dec-96
1	KEENE	19-Dec-96
Total number of allotments updated in 1996: 9 allotments		
4	POORMAN/WILLOW	27-Aug-97
4	STEMPLE SOUTH POORMAN	27-Aug-97
Total number of allotments updated in 1997: 2 allotments		
1	NORTH BEAVER	18-Jun-98
1	EAST PACIFIC	18-Jun-98
1	POLE CREEK	18-Jun-98
1	WHITEHORSE	18-Jun-98
2	TIZER	18-Jun-98
2	MCCLELLAN	18-Jun-98
2	MAUPIN	18-Jun-98
2	BROWNS GULCH	18-Jun-98
2	COCHRAN	23-Jun-98
2	NELSON-FAVORITE	23-Jun-98
2	JIMBALL	23-Jun-98
2	JIMTOWN	23-Jun-98
2	BIG LOG	23-Jun-98
2	EW FRENCH	23-Jun-98
2	MOORS MOUNTAIN	23-Jun-98
2	YORK HILLS	23-Jun-98
2	HILGER	23-Jun-98
2	WILLOW CREEK	23-Jun-98
2	INDIAN FLATS	23-Jun-98
2	GROUSE RIDGE	23-Jun-98
2	CELLAR-OGILIVIE	22-Sep-98
Total number of allotments updated in 1998: 21 allotments		
1	AVALANCHE	28-Jan-00
1	MAGPIE	28-Jan-00
1	WHITES GULCH	28-Jan-00
1	TICK GULCH	28-Jan-00
Total number of allotments updated in 2000: 4 allotments		
Total number of allotments updated from 1995 through 2005: 37 allotments		
Total number of allotments update from 2000 through 2005: 4 allotments		

***Data Analysis Methods:***

These are observational data which have been summarized.

***Monitoring Results:***

Four allotment management plans were updated from 2000 through 2005. A total of 37 allotments have been updated in the past ten years.

**Variability Measure Discussion:*****Variability Measure:***

Less than 4 plans updated annually, planned objectives are not being met.

***Assessment:***

An average of less than one allotment management plan was updated from 2000 through 2005. An average of 3.7 allotments have been updated annually over a ten year period. This variability measure is not being met.

***Actions in response to variability assessment:***

The Forest needs to increase the number of allotment management plans that are being updated annually to meet the requirements of this element. Ten allotments are planned for updates in 2006, which will improve movement towards meeting the requirements of this element.

**Recommended Efforts:**

Continue to monitor updated allotment management plan implementation. Conduct utilization studies and monitoring as required in the environmental documents. Permits should be adjusted if changes projected in the environmental analyses do not occur. Make any future AMP revisions adaptive management so that issues can be addressed without having to repeat the NEPA process except for site specific items such as additional water developments or fences.

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**(D3) Weed Infestations****Forest Plan Requirements:**

Monitor weed infestations

***Intent***

Monitor weed infestations, effectiveness of control measures activities responsible, implementation of IPM techniques.

**Data Sources:**

Sources include Allotment inspection records, reforestation exams, range analysis, mining projects, road inspections, CE projects, KV plans, and the Weed EIS.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Ocular estimates evaluating treatment effectiveness is utilized to plan and assess future treatment priorities (roads, campgrounds, trailheads). A combination of ocular, photo points, population counts (sweeps), and nested rooted frequency (stem counts, canopy cover, and stem density) is utilized to monitor biological populations and effectiveness. Research plots are designed to determine effectiveness

of the treatment, or rate of invasive species spread. Research plots are set up to measure percent cover, density and rooted frequency. Risk analysis and modeling was conducted to provide data for the development of the weed EIS and be utilized as a management tool for noxious weeds. This information is located in the Weed EIS project file and the weed monitoring files present at each district.

Monitoring typically consists of photo-points, stem counts, net sweeping and/or ocular observation and detailed vegetation analysis.

***Monitoring Activities:***

*Monitoring / Mapping*

Monitoring occurs annually across various areas of the Forest, however, the level or intensity of monitoring depends upon the level of funding. It provides an overview of treatment effectiveness and provides information for adaptive management.

Six biological release sites and 25 plus herbicide treatment sites were monitored in FY 05. Due to the long term nature of biological control, it may not be cost effective to do extensive monitoring every year.

In FY 05 the Helena contracted to have detailed biological agent monitoring done on the sites listed below in Table 1. The objective of the project was to monitor where biological control agents have been released to:

- determine if the insects have become established at the release site;
- measure the general size of the bio-control agent population at one or two points in time;
- assess the spread of these insects away from the immediate release site;
- quantify the population of the target weed species at each release site to permit describing change over time;
- note site characteristics at each location to eventually permit correlating these characteristics with success or failure of insect population establishment; and
- establish permanent photo points at each release site to display changes in plant populations over time.

This project was part of a cooperative project with MSU Research Station to begin a comprehensive review of biological management across land ownerships. The project report identified sites with sufficient insect populations for future collections and sites suitable for future releases.

**TABLE 1 – FY 05 BIOLOGICAL MONITORING**

Site	Bio Agent	Target Species	Photo Points	Stem Counts	Net Sweep
Cave Gulch/Coxey Gulch	Mecinus janthinus	DT	8	12	Reduction on plant size, vigor, and stems/acre
Horse Gulch/Magpie	Apthona nigriscutus/flava	LS	1	4	Minimal stems found/Feeding damage evident/Redistribution is ongoing
	Larinus minutus	SK			
	Apthona	LS			

Site	Bio Agent	Target Species	Photo Points	Stem Counts	Net Sweep
	nigriscutus/lacertosa				
Whites Gulch, Indian creek, Cabin Gulch	Cyphocleonus achates	SK	9	22	Feeding damage evident, Roots infested – insectary nearly free of knapweed
Aldrich Gulch	Mecinus janthinus	DT & CT	3	3	No feeding damage at the insectary, added a release
	Apthona nigriscutus	LS			
	Apthona nigriscutus	LS			
	Apthona nigriscutus	LS			
	Apthona nigriscutus	LS			
	Apthona nigriscutus/flava/lacertosa	LS			
	Apthona nigriscutus	LS			
	Larinus minutus	SK			
	Larinus minutus	SK			
	Apthona nigriscutus/flava	LS			
	Apthona nigriscutus	LS			
	Apthona cyparissiae	LS			

The following steps are undertaken when evaluating biological release sites.

- determine if the insects have become established at the release site;
- measure the general size of the bio-control agent population at one or two points in time;
- assess the spread of these insects away from the immediate release site;
- quantify the population of the target weed species at each release site to permit describing change over time;
- note site characteristics at each location to eventually permit correlating these characteristics with success or failure of insect population establishment; and
- establish permanent photo points at each release site to display changes in plant populations over time.

#### Herbicide Effectiveness Monitoring

Table 2 displays the effectiveness of various herbicide treatments on the target species. Effectiveness monitoring provides significant information for future strategies and planning efforts.

**TABLE 2 – FY 05 HERBICIDE EFFECTIVENESS MONITORING**

Site	Target Species	Method/Observations
Whites Gulch	Knapweed/thistles	Whites Drainage, Spring gulch – Inventoried the entire area, 200 acres, contract sprayed in 2004. In July Of 2005 less than 1% surviving knapweed and

Site	Target Species	Method/Observations
		approximately 5% surviving thistles.
Magpie & Hunters Gulch	Knapweed/Canada thistle/musk thistle/toadflax/spurge	Checked the area contracted sprayed in Sept. 2004 for effectiveness – Excellent results less than 1% survival on target species.
Hellgate	Knapweed/thistles	Checked permanent plots est. in 2002 to monitor effectiveness – treated area represents 90% weed free.
Hog Hollow	toadflax	Dr. Sing, K Friedrichson, and I checked the Hog Hollow burn unit for weeds and planted 11 toadflax plants with m. janthnus larva to see if the larva would survive a prescribed burn passing over. Check in spring 05 and spray plants. In 05 all but one of the toadflax plants had survived, and the larvae released in 04 did not survive the burn.
Roadside: D1	Toadflax, spurge, hawkweed, common tansy, houndstongue, knapweeds,	Roads were driven and spot sprayed. Large polygons on nearby hillsides may or may not have been sprayed depending on access. (Deep Creek Canyon is filled with cliffs that are not accessible to ground spraying equipment.) Forest Priorities are Roadsides, and trailheads – new invaders – and finally large infestations. The Right of Ways on the roads listed above have been effectively treated with herbicides with 80 to 95% of the weeds killed. There are polygons of weeds extending outside of the right of ways in some areas that need additional treatment.
Cave Gulch Fire Area	Dalmatian toadflax, leafy spurge.	Twenty herbicide effectiveness plots have been read since 2001. Pre and post fire evaluations collecting photo points, stem densities, rooted frequencies, canopy coverage and GPS locations are documented. To date, treatments display a range of 70 to 90% control.
Elkhorn Mtn. Range Crystal Creek	Tall buttercup	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored.
Elkhorn Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, hounds-tongue	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Isolated back country infestations continue to spread.
Belts Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Areas of infestations have continually grown. Level of treatment doesn't annual spreading rate.
Divide Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed,	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Areas of infestations have continually grown. Level of treatment doesn't meet or exceed annual spreading rate.
Blackfoot Mtn.	Spotted knapweed,	Photo points established and ocular site condition noted.

Site	Target Species	Method/Observations
Range	Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed,	Treatment and effectiveness will continue to be monitored. Areas of infestations have continually grown. Level of treatment doesn't annual spreading rate.
Elkhorn, Belts, Divide, and Blackfoot road rights of way	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed, oxeye daisy, henbane	Ocular observations to determine effectiveness and to prioritize treatment areas. Roadside treatment is the number one priority of treatment. Effectiveness of treatments is very high.
Dry Creek	Yellow toadflax	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Area of infestation has continually grown over the past few years.
Poorman KV	Spotted knapweed Musk thistle	Ocular, this road system was initially treated under the sale contract upon entry. Follow up treatments are being accomplished with KV funding. This road system was highly infested and will require retreatment to reduce the soil seed bank and get this road system in good condition.
Alice Creek	Yellow toadflax	Photo points established to monitor infestation size and effectiveness of treatment. Infestation has remained stable over the past two years.
Moose Creek	Spotted knapweed	Photo points established. Ocular estimates of infestation canopy cover and site description noted.
Road right-of-ways	variety	Ocular observations to determine effectiveness and to prioritize treatment areas.
Trail heads	Spotted knapweed	Ocular observations, Determine application needs and signing. Trail heads on the district have a low level of weed infestations.
Wilson prescribed burn	Spotted knapweed	Ocular, general site condition and infestation size and canopy cover noted.

Table 3 displays vegetation plots measuring effectiveness of various herbicide treatments on the target species, and non-target vegetation response resulting from treatment. The purpose is to monitor the effects of reducing more competitive, undesirable plants, provides data on the desirable (native) species in relation to reduced competition as well as new invaders occupying the site.

**TABLE 3 –WEED / VEGETATION MONITORING PLOTS**

Ranger District	Project Area	Plot Type	Comments
Townsend	Lower Magpie	Paired Macroplots	Report pending- ocular assessment herbicide treatment 90% successful (riparian)
Townsend	Coxcy Gulch	Paired Macroplots	Report Pending – ocular assessment herbicide treatment 90% effective (upland)

Ranger District	Project Area	Plot Type	Comments
Townsend	Avalanche Gulch, Doolittle branch	Paired Macorplots	Report Pending- ocular assessment herbicide treatment 90% effective, revegetation 80% some cheatgrass invading
Townsend	Hellgate Gulch	Paired Macroplots	Report pending- Ocular assessment herbicide treatment effectiveness 98%  These monitoring sites are also listed under the Research section as they are part of ongoing research concerning weed invasion after wildfires.
Townsend	Jenkins Gulch (Elkhorns)	Line intercept plots	Bio-control treatment of Dalmatian toadflax monitoring began in 1991 and continues through 2004. Dr. David Weaver of MSU is the lead researcher on this project. It was started by Dr. Bob Nowierski.
Helena	Cave Gulch	Paired Macroplots Line intercept & density counts	Twenty-five plots have been monitored to record vegetative changes and herbicide effectiveness in response to the 2000 wildfire season. Species composition, density, canopy cover and rooted frequency are measured based on 3 fire intensities; low moderate and high.
Helena	Beaver Creek veg restoration site	Ocular and photo point	Ocular, general site condition, reseeding establishment and canopy cover noted. Herbicide treatment and followup seeding on eroded delta fan infested with spotted and diffuse knapweed.

***Data Analysis Methods:***

Simple statistics were performed on the data.

***Monitoring Results:***

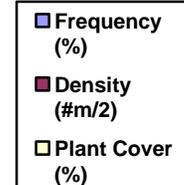
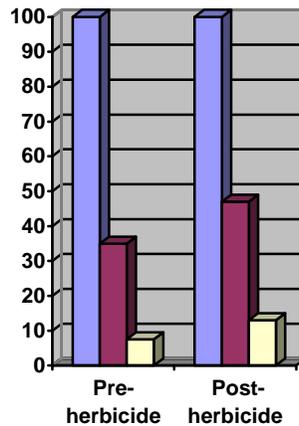
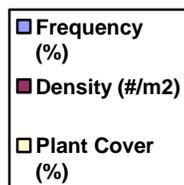
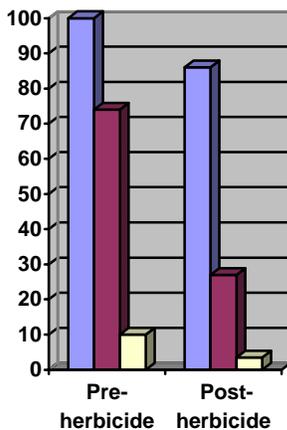
Effectiveness monitoring indicates mixed success. The variability of success becomes grossly evident depending upon species and site characteristics. Effectiveness monitoring has increased since 2001 due to the increased funding. Herbicide treatment on 20% of inventoried acres contained and controlled weed infestations from increasing across the Forest. Table 4 and the following charts display data collected from over 25 herbicide effectiveness plots established in 1999.

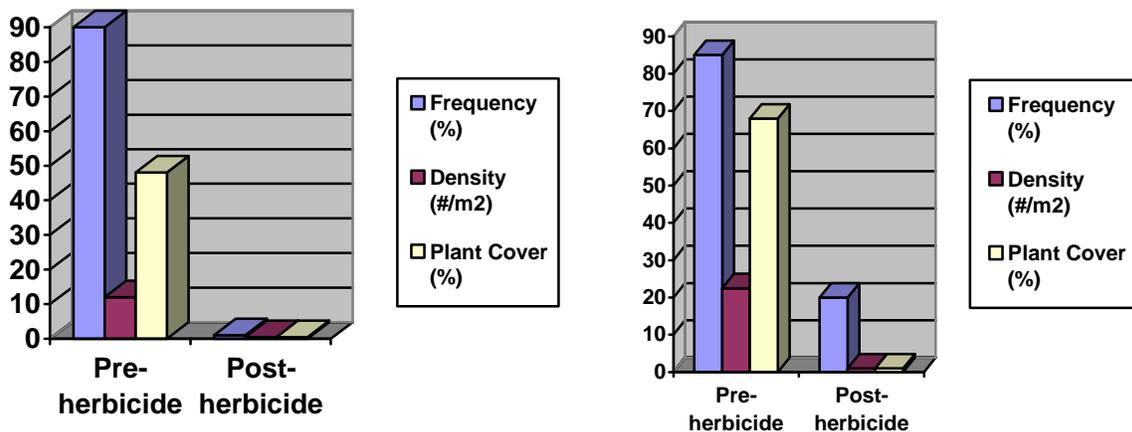
Biological control was elevated significantly in 2001, releasing approximately 1 million insects each year until 2004. Insect populations have been recorded as having the physical capability to survive harsher climatic conditions on most of the release sites. Higher than expected survival rates, appear to be reducing target weed species and rate of spread. Photo points identify reductions in plant density and plant cover, and redistribution efforts are ongoing.

Research

**TABLE 4 – WEED RESEARCH**

Principal Investigator	Research Objective	Research Unit	Status
Dr. Sharlene Sing and Dr. George Markin	TIPP (Toadflax Insectary Pilot Project In the Cave Gulch fire area, Maggie Drainage.	RMRS Bozeman	Releases made and monitoring established. Monitoring has been done years 2002- 2005
Dr. Sharlene Sing, and Jennifer Birdsall	Herbicide effectiveness macroplots in the Cave Gulch fire area. Paired Plots located in Maggie Gulch, Coxcy Gulch, Doolittle (in Avalanche), and Hellgate Gulch.	RMRS Bozeman	Plots read and reports made in 2002, 2003, 2004 and report pending for 2005.
Dr. Sing and D. Johnson	Will the bio-agent for toadflax, <i>M. janthnus</i> , survive prescribed burning. In hot, moderate, and cool burn conditions. (Can this insect be used in pre-treatment for proposed burn units without destroying the population during the burn?)	RMRS	Research plot set up and burned in October, 04. Results of monitoring in 2005 indicate toadflax plants survive but insects do not.
Dr. Sharlene Sing, Dr. George Markin and Jay Winfield	Eight TIPP (Toadflax Insectary Pilot Project In the Cave Gulch fire area, York gulch, Kingsberry gulch, and Oregon gulch.	RMRS Bozeman	Plots read and reports made in 2001, 2002, 2003, 2004 and report pending for 2005.
Jay Winfield	Study four habitat types within the Cave Gulch Fire area to determining the relationship between fire and noxious weeds	RMRS Missoula	Ocular evaluations made to determine significant changes
Jay Winfield	Study Telar and Tordon effectiveness in controlling Leafy spurge and Dalmatian toadflax at high and low densities	RMRS Missoula	Ocular evaluations made to determine significant changes





### Variability Measure Discussion:

#### *Variability Measure:*

Noxious weeds increase distribution by 5%; other weedy species by 10%; infestations appear in previously unaffected areas (1986 Forest Plan).

#### *Assessment:*

Based on the 1987 weed EIS, inventories indicate 3,641 acres infested with noxious weeds. The preferred alternative identified 638 acres treated annually, which is 17.5% of the total infestation. This level of treatment was consistent with the Forest Plan. Noxious weed treatment activities under this schedule were greater than the projected annual rate of spread of 5 – 10% identified in the Forest Plan.

The most recent weed EIS efforts inventoried 22,668 and 198 miles of infested roadside for a total of approximately 23,000 acres. Simple statistical calculations comparing the 1987 and 2006 weed EIS inventoried acres computes an annual spread rate of 10.75% over the past 19 years. These calculations exceed the variability identified in the 1986 Forest Plan for this element.

Significant expansion of the noxious weed program was a result of the 2000 fire season. Budgets gained significantly, rising to several million dollars each year, providing the foundation for halting weed expansion. A Noxious Weed EIS has been prepared identifying the need for action. The Record of Decision has been approved allowing for adaptive management including aerial treatment on lands outside the grizzly bear recovery zone. Education, monitoring, research and herbicide and biological control from 2001 through 2005 have held noxious weeds in check.

#### *Actions in response to variability assessment:*

Project specific NEPA documents (timber and fuels) on the Forest routinely address weed treatments, expanding acres beyond the 1987 noxious weed and Forest plan thresholds in an effort to curtail weed spread. Funding was cyclic with minimal increases year to year, but based on inventoried acres the districts were unable to treat 15% (documented rate of spread based on research) of the total Forest acres.

Noxious weed management efforts have been expanding since 1996 with peak years' center around the fire restoration activities of 2001 – 2003. In 1997 an emphasis was placed on re-inventorying noxious weed infestations across the Forest in preparation of a new weed EIS. Inventories completed in 2000 indicated 22,668 acres and 198 miles of roads infested with noxious weeds. The rate of spread of these weeds is expected to expand 14 % per year (Asher 1998) and may increase due to large wildfires (recent

and future). Restoration funding provided an increase in all facets of noxious weed management. Since 2003 restoration funding has been reducing and the Forest has strained to maintain the control efforts implemented in 2001 – 2003. Consequently, noxious weed infestations prior to 2001 and post 2003 have and will continue to spread at a greater rate than the annual rate of control.

A risk analysis was completed for the Helena National Forest and found that an estimated 319,700 acres on the Forest are currently susceptible to weed invasion based on acres of rangeland and forested areas with less than 35 percent tree canopy coverage, including 43,000 acres burned in 2000.

**Table5—Total FY05 Helena National Forest Direct Weed Control (Acres)**

CONTROL TYPE	D1	D2	D4	TOTAL
Herbicides (Acres)	274.5	1708	1920	3902.5
Biological Agents (acres)	360	400	5	765
Pulling (Acres)	1	5	1	7
Revegetation (seeding acres)				
Cultural (mowing / irrigation)	1	7	1	4
TOTAL	636.5	2120	1927	4682.5

**Table 6-- FY 05 Herbicide Treatment By Fund Code (Acres)**

FUND CODE	D1	D2	D4	TOTAL
CWKV - KV	23.5		62	85.5
NFWW – Weed Mgt.	251	1059	852	2162
WFHF - Fuels		8		8
NFWF - Wildlife			83	83
BAER – Burned Area Recovery				
COOP		89	923	1012
NFN3 – Fire Rehab				
FIRE SUPPRESSION REHAB				
CONTRACT		45		45
RAC – Resource Advisory Committee		503		503
STEWARDSHIP				
Administrative Site		9	5	14
TOTAL	274.5	1708	1925	3912.5

**Table 7 – FY 05 Herbicides Used**

HERBICIDE	REGISTRATION#	LBS/AI	ACRES	RANGER DISTRICT	APPLICATION METHOD
2,4-D	228-145	892.7	65	HNF	Ground
	01381-00103				
	71368-1				

HERBICIDE	REGISTRATION#	LBS/AI	ACRES	RANGER DISTRICT	APPLICATION METHOD
	34704-120				
	5905-501				
PICLORAM	62719-6	897.5	3589.5	HNF	Ground
IMAZAPIC	241-365				
CLOPYRALID	62719-259	2.25	3	HNF	Ground
METSULFURON METHYL	352-439	7.28	200	HNF	Ground
CLOPYRALID/2,4-D (CURTAIL)	62719-48				
CHLORSULFURON	352-522	1.13	18	HNF	Ground
DIGLYCOLAMINE	100-884				
GLYPHOSATE	42750-59	1.35	2	HNF	Ground
DICAMBA (VET10G)	28-309				

**Targeted weed species:** white top, musk thistle, diffuse knapweed, spotted knapweed, oxeye daisy, Canada thistle, houndstongue, leafy spurge, St. Johnswort, Dalmatian toadflax, yellow toadflax, sulfur cinquefoil, common tansy, tall buttercup, and orange hawkweed.

*Biological Treatment*

The Helena NF released 11,350 biological agents on the Townsend, Helena, and Lincoln ranger districts (see table 4). At the regional standard of 250 agents/release and five reportable acres/release, the Helena NF did a total of 45 releases @ 5 acres/release for a total of **225** acres treated with biological management agents.

**TABLE 8 – FY 05 BIOLOGICAL MANAGEMENT AGENT RELEASE**

RANGER DISTRICT	BIOLOGICAL AGENT	TOTAL NUMBER RELEASED	# OF RELEASES @ 250 RELEASED	TARGET SPECIES
Townsend & Lincoln	Cyphocleonus achates	300	1	SK
Helena	Cyphocleonus achates	10,300(Redistribution efforts underway)	41	LS
	Apthona lacertosa			LS
	Apthonia flava			LS
Townsend & Helena	Obera erythrocephala	750	3	DT
	Mecinus janthinus			DT
	Brachypterolus pulicarius			SJ
	Aplocera plagiapa			SJ
	Chrysolina spp			SJ

RANGER DISTRICT	BIOLOGICAL AGENT	TOTAL NUMBER RELEASED	# OF RELEASES @ 250 RELEASED	TARGET SPECIES
	Ceutorhynchus.litura Urophora.cardui Cyphocleonus achates Mecinus janthinus Chrysolina spp. Rhynocillus conicus	50 insects moved     50 insects moved		CT CT SK DT SJ

Total acres treated by bio agents 765

#### Manual Treatment

Pulling occurred on approximately 9 acres of weed infested areas on the Helena NF. This activity was focused on small infestations in backcountry areas, trailheads, ranger stations, campgrounds, grazing allotments, administrative sites and burned areas. Table 5 below provides details on this activity.

**TABLE 9 – FY 05 WEED PULLING**

Ranger District	Acres Pulled	Location/Target Weed
Townsend	1	Knapweed pulled in Whites gulch between the salt ground and ridge in the South pasture
Townsend	Few plants	
Helena	2	Knapweed, Perennial pepper weed, Dalmatian toadflax were pulled at various times on administrative sites to eliminate non-target mortality.
Helena	5	Knapweed, and Dalmatian toadflax were pulled at various times in the Gates of Mountains Wilderness area, specifically at Meriweather and Coulter campgrounds to eliminate non-target mortality and recreation/public visitor herbicide concerns.
Lincoln	1	Knapweed, yellow toadflax, common tansey, and St. John'swort were pulled at various times on administrative sites, and riparian areas to eliminate non-target mortality and recreation/public visitor herbicide concerns. Aspen Campground and Moose Creek Trailhead.
TOTAL	9	

#### Cultural Control

Mowing and watering was conducted at many of the developed recreation sites, livestock facilities, trailheads and other administrative worksites. Cultural weed control activities are summarized below in Table 10.

**TABLE 10 - FY 05 CULTURAL WEED CONTROL**

Ranger District	Acres Treated	Site And Treatment
Townsend	Few Plants	Musk thistle cut on the top of the divide between Avalanche and Whites gulch.
Helena	4	Musk thistle infestations were chopped around an electric fence enclosure in a Riparian area to reduce the potential of shorting out the electrical current and to prevent seed production.
TOTAL	4	

Weed Education

Weed education, awareness and prevention are a high priority on the forest. Basic weed awareness and identification training is provided to the districts at orientation and field identification handbooks and weed calendars are made available to employees. Weed education is an ongoing activity on the Helena NF and is not limited to formal presentations. Constant interaction occurs between the Helena NF weed staff and all functional areas and specialists. Districts are signing trailheads with weed awareness information, "Weed Free Feed Required" signs are posted on major forest access roads; recreation site bulletin boards and "Leave No Weeds" posters and other weed information brochures.

**TABLE 11 – FY 05 EDUCATION PRESENTATIONS**

Date	Teacher	School	# of Presentations	# of Students
March 05	Wes Simpson	Dow Agro Sciences/FS	1	30
May 05	Diane Johnson	RMRS – Rocky Mtn. Research Station for Bio-Control	1	20
May 05	Jay Winfield, Phil Walsh, Jim Nelson	Dearborn WMA	2	40
May 05	Shawn Heinert	Lincoln school district	6	65
June 05	Phil Walsh, Jim Nelson, Jay Winfield	Ross Gulch	2	10
July 05	Jay Winfield	Elkhorn Working Group	1	11
July 05	Wes Simpson, Phil Walsh, Vicky Maclean, Jim Nelson, Misty Hamilton	Lewis and Clark Co. Fair Booth	8	150

**Recommended Efforts:**

Release the Record of Decision on the Noxious Weed EIS and begin implementation in 2006.

Plan and implement treatment of 6,000 plus acres annually to curtail the annual spread rate and meet the goals and objectives outlined in the 2006 weed EIS. Increase funding to support the aggressive effort identified in the noxious weed EIS. The new weed EIS is consistent with the new state wide weed management plan that is currently implemented by all counties across the state of Montana. Noxious weed management strategies include; control, contain, and eradication of new invaders.

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## (D4.1 ) Condition and Trend of Range and Forage Availability

### Forest Plan Requirements:

Monitor the condition and trend of range and forage availability.

#### *Intent*

Identify 1) long term changes in range condition and trend, recommend change in management strategies and/or stocking levels.

### Data Sources:

INFRA database, allotment inspection records, transect data, photo plots, wildlife surveys, burn area monitoring, and environmental documents. FSRAMIS was identified as a data source in the Forest Plan. This database has been replaced with the INFRA database, so it is not available or appropriate as a data source.

### Current Efforts and Findings:

The condition and trend of allotments evaluated in this portion of this element includes those AMPs that have been updated in the past 10 years (1995 through 2005). An assessment of ongoing annual monitoring is summarized as well. Annual monitoring is important to help identify long term trends of use, which determine condition and trend.

#### *Documentation of monitoring methodology:*

Rangeland condition and trend has been monitored through quantitative data collection with ECODATA, TERRA and FSVEG protocols, specifically cover/frequency and ocular plant composition methods, and qualitative stand stage mapping which is based on ECODATA inventory.

The Region 1 rangeland data collection system from the mid-80's through the early 90's was collectively called ECODATA. Cover/frequency, line intercept and plant composition protocols were used throughout the Forest during that time. ECODATA has been replaced by the NRIS national database TERRA protocols which are very similar to ECODATA protocols. ECODATA legacy data has been "rolled over" into the TERRA system.

Allotments that are being inventoried for the purpose of plan update are mapped using stand stage protocols, and additional data collection using quantitative protocols such as plant composition data or cover/frequency data is used to validate the stand stage mapping. Protocol descriptions for plant composition and line intercept can be found on the NRIS website <http://fsweb.wo.fs.fed.us/rge/inventory/index.shtml> . The protocol for cover/frequency is described on the FIREMON website [http://www.fire.org/index.php?option=com\\_content&task=category&sectionid=5&id=18&Itemid=42](http://www.fire.org/index.php?option=com_content&task=category&sectionid=5&id=18&Itemid=42) but will be included in the TERRA protocols in the future.

The stand stage methodology is found in the project file. ECODATA plot data were used to create the stand stage descriptions which are found in the project file. Stage 1 most closely resembles lightly grazed grasslands for a given habitat, while stage 4 is least like a lightly grazed grassland. The letter "I" signifies that a large amount of introduced grasses are present. Indicator plant species (plants such as rough fescue or Idaho fescue) and bare soil are key indicators of stand stage. This is an ocular mapping method, and a form is filled out for the polygon that is being mapped.

**Monitoring Activity:**

Allotment management plan updates for the past ten years are shown in the following table. Actions that were taken in the plan updates are shown and monitoring and actions taken since the plan update are summarized as well.

<b>Allotment Name</b>	<b>NEPA Decision Date</b>	<b>Action Taken in Plan Update</b>	<b>Monitoring, Results and/or Actions Taken since Plan update</b>
THOMAS CREEK	19-Dec-96	20% reduction in season of use Improve riparian and upland conditions and distribution <u>Vegetation:</u> Key areas have been established Improvements: reconstruct 4 water developments	Monitoring: Monitored annually by permittee  Improvements: all improvements have been reconstructed and some new ones not identified in AMP have been completed. Likely to not have decreased condition due to the reduction and improvement construction.
CEMENT GULCH	19-Dec-96	36% increase in numbers but a 38% decrease in season of use. Currently, this allotment is grazed every other year due to lack of water. <u>Vegetation:</u> Key areas have been established Improvements: 1 fence to be reconstructed, all water developments were reconstructed prior to AMP revision.	Improvements: all improvements have been reconstructed  Likely to not have decreased condition due to the reduction and improvement construction.
MULE CREEK	19-Dec-96	Was combined with Camas pre-plan, Now separate allotments, 30% reduction in numbers and season. Currently, added 10% back to numbers. Improve riparian and upland conditions and distribution <u>Vegetation:</u> Key areas have been established Improvements: reconstruct 8 water developments	Began field verifying previous stage stand mapping because some areas in stage 3 and 4 are rocky, steep slopes with no livestock use Improvements: all improvements have been reconstructed.  Likely to not have decreased condition due to the reduction and improvement construction.
CAMAS CREEK	19-Dec-96	7% reduction in numbers and season. Improve riparian and upland conditions and distribution <u>Vegetation:</u> Reclassify existing stage 3 & 4 areas using stage/standing mapping	Monitoring: stage 3 and 4 areas were remapped to stage 2 and 3 areas, average upland utilization was 31% met standards, riparian utilization on Little Camas Creek was 65%, which exceeded standards

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		<p>process, key areas have been established</p> <p>Improvements: reconstruct 4 water developments</p>	<p>Improvements: 2 improvements have been reconstructed</p> <p>Likely to not have decreased condition due to the reduction, proper utilization and improvement construction.</p>
SPRING CREEK	19-Dec-96	<p>9% increase in numbers</p> <p><u>Vegetation</u>: key areas have been established</p> <p><u>Hydrology</u>: establish long term cross sections in representative riparian areas</p> <p>Improvements: reconstruct 5 water developments, 6 new water developments to construct, reconstruct 4 fences</p>	<p>Riparian cross sections reread in; Beaver Creek - 1998, 2000. Slight improvement in the seral vegetation within the transects, the banks were becoming more vegetated with carex and red-top.</p> <p>Improvements: 5 improvements have been reconstructed and 2 new developments have been constructed, 4 fences have been relocated or reconstructed.</p> <p>Likely to not have decreased condition as shown by cross sections and improvement construction.</p>
WATSON	19-Dec-96	<p>5% increase in season</p> <p>Improve riparian and upland conditions and distribution</p> <p><u>Vegetation</u>: key areas have been established</p> <p><u>Hydrology</u>: establish long term cross sections in representative riparian areas. Vermont Creek has been fenced and is used as a holding pasture.</p> <p>Improvements: reconstruct 4 water developments, reconstruct 2 fences</p>	<p>Monitoring: Monitored annually by permittee</p> <p>Riparian cross sections reread in; Vermont - 1998, 2000, 2002. Carex, redtop and rushes are more established on the banks. Bare areas are slowly becoming vegetated. Vegetation is trapping sediment.</p> <p>Improvements: 4 water developments have been reconstructed and 2 fences have been relocated or reconstructed. A new water development was added to the allotment not identified in the plan.</p> <p>Likely to not have decreased condition as shown by cross sections and improvement construction.</p>
SNEDAKER BASIN	19-Dec-96	Combined with Wagner allotment in 1996	
WAGNER SNEDAKER	19-Dec-96	<p>20% reduction in permitted numbers and 15 days in season</p> <p><u>Vegetation</u>: key areas have</p>	<p>Riparian cross sections reread in; Trout Creek – 1997, 1998</p> <p>Conditions were the same, utilization by the sheep was</p>

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		<p>been established</p> <p><u>Hydrology:</u> establish long term cross sections in representative riparian areas</p> <p>No improvements are planned for this allotment.</p>	<p>excessive.</p> <p>Improvements: 2 water developments have been reconstructed that were not identified in the AMP</p> <p>Likely to not have decreased condition as shown by cross sections; also reduction in numbers and improvement construction.</p>
KEENE	19-Dec-96	<p>Approximately 20% decrease in numbers and season because Private land is not included in the stocking rate.</p> <p>No improvements are planned for this allotment because improvements are on private land.</p>	<p>Likely to not have decreased condition due to reduction.</p>
POORMAN/WILLOW	27-Aug-97	<p>The AMP decreased the grazing season and head months</p> <p><u>Vegetation:</u> key areas have been established, a long term (effectiveness) monitoring plot was established in 2003 on Willow and will be read again in 2008 to establish data to determine change in trend.</p> <p><u>Hydrology:</u> Three short term (implementation) monitoring plots were established to monitor riparian area utilization, stubble height and bank alteration to meet the requirements of the Infish Biological Opinion.</p> <p>Improvements: reconstruct 1 water development, reconstruct 1.5 miles of fence and 1 cattleguard</p>	<p>Average upland utilization was 30%, standards were met, 6" stubble height and 12% bank disturbance, 10% riparian use</p> <p>Improvements: 1.5 of fence and cattleguard has constructed</p> <p>Likely to not have decreased condition due to the reduction, proper utilization and improvement construction.</p>
STEMPLE SOUTH POORMAN	27-Aug-97	<p>Combined with Poorman/Willow,</p>	<p>Poorman drainage was removed from the allotment due to fisheries concerns. No decrease in allotment conditions</p>
NORTH BEAVER	18-Jun-98	<p>Increase in the season of use 5 days</p>	<p>ECODATA plots have been re-read or re-photographed in 2004-2005 due to ERG study for the</p>

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		<p>Improve riparian and upland conditions and distribution</p> <p><u>Vegetation:</u> key areas have been established</p> <p><u>Wildlife:</u> Do random measurements within any grazing area prior to June 30 to insure that stubble heights of at least 6" are left.</p> <p>Improvements: reconstruct 1 water development, reconstruct 2 fences</p>	<p>Elkhorns, Average utilization was 23%, standards were met, permittees did ocular estimates of elk use prior to livestock entering the forest.</p> <p>Improvements: Water developments and fences have been reconstructed and 2 new developments have been constructed</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
EAST PACIFIC	18-Jun-98	<p>No change in stocking rate or season of use</p> <p>Improve riparian and upland conditions and distribution</p> <p><u>Vegetation:</u> key areas have been established</p> <p><u>Wildlife:</u> Measure utilization levels on core winter range areas to insure 3" forage base.</p> <p><u>Hydrology:</u> establish long term cross sections in representative riparian areas</p> <p>Improvements: reconstruct 8 water development, reconstruct 4 fences, one private boundary</p>	<p>ECODATA plots have been re-read or re-photographed in 2004-2005 due to ERG study for the Elkhorns, Average utilization was 35%, meeting standards utilization and for core winter range for elk</p> <p>Riparian cross sections reread in; Lower Weasel Creek – 1998 Upper Weasel Creek – 1999</p> <p>These transects have only been read once so a comparison is not available.</p> <p>Wildlife utilization was monitored with the ERG study prior to livestock entering the forest.</p> <p>Improvements: 6 water developments have been reconstructed and 2 fences have been constructed using electric fence. 2 fences were reconstructed in 2001.</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
POLE CREEK	18-Jun-98	<p>No change in stocking rate or season of use</p> <p>Improve riparian and upland conditions and distribution</p> <p><u>Vegetation:</u> key areas have been established</p> <p><u>Hydrology:</u> establish long term cross sections in representative riparian areas</p>	<p>ECODATA plots have been re-read or re-photographed in 2004-2005 due to ERG study for the Elkhorns, Average utilization was 19%, monitored by FS and permittees</p> <p>Riparian cross sections reread in; Pole Creek – 1999</p> <p>These transect has been read</p>

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		Improvements: reconstruct 4 water development, reconstruct 1 fence if monitoring indicates the need	once so a comparison is not available. Wildlife utilization was monitored with the ERG study prior to livestock entering the forest. Improvements: 3 water developments have been reconstructed and a new one constructed that was not identified in AMP, monitoring indicates that the fence is not necessary in Horsethief park. Likely to not have decreased condition due to proper utilization and improvement construction.
WHITEHORSE	18-Jun-98	No change in stocking rate or season of use <u>Vegetation:</u> key areas have been established <u>Hydrology:</u> establish long term cross sections in representative riparian areas <u>Wildlife:</u> Measure utilization levels on core winter range areas to insure 3" forage base. Improvements: reconstruct 4 water development, reconstruct 1 fence	ECODATA plots have been re-read or re-photographed in 2004-2005 due to ERG study for the Elkhorns, Average utilization was 21%, meet utilization standards and for core winter range for elk. Riparian cross sections reread in; Kimber Creek – 1999, 2003 Carex and redtop are more established on the bank, trapping sediment. The greenline is getting wider because livestock impacts have been minimized. Wildlife utilization was monitored with the ERG study prior to livestock entering the forest. Improvements: 4 water developments have been reconstructed and all interior fences were reconstructed with a grant in 2001. Likely to not have decreased condition due to proper utilization and improvement construction.
TIZER	18-Jun-98	No active grazing	No decrease in allotment conditions
MCCLELLAN	18-Jun-98	11% reduction <u>Hydrology:</u> establish long term cross sections in representative riparian areas. <u>Vegetation:</u> key areas have been established	Riparian cross sections reread in; Corral Creek – 98, 00 Some improvement in vegetation composition. Bare areas are beginning to fill in with vegetation. Lots of use by

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		Improvements: reconstruct 4 water development, reconstruct 1 fence	wildlife. Average upland utilization was 43%, standards were met, riparian utilization was Miller Creek 43% and Crystal creek was 43% Improvements: 1 water development has been constructed Likely to not have decreased condition due to proper utilization, reduction in numbers and improvement construction.
MAUPIN	18-Jun-98	12% reduction in plan, 76% reduction since decision due to permittee change <u>Vegetation</u> : key areas have been established Improvements: reconstruct 3 water development, reconstruct 1 fence	Average upland utilization was 35%, and riparian utilization was Maupin Creek 33%, 15% Streambank disturbance and Willard creek was 40%, 15% Streambank disturbance Improvements: 1 water developments has been reconstructed and 1 cattleguard installed Likely to not have decreased condition due to reduction and improvement construction.
BROWNS GULCH	18-Jun-98	cooperatively managed with the adjacent BLM allotment Permit waived back to government <u>Hydrology</u> : establish long term cross sections in representative riparian areas	Currently not stocked with livestock Riparian cross sections reread in; Browns Gulch – 98 These transect has been read once so a comparison is not available. No decrease in allotment conditions
COCHRAN	23-Jun-98	No active grazing	No decrease in allotment conditions
NELSON-FAVORITE	23-Jun-98	Improve riparian and upland conditions <u>Vegetation</u> : key areas have been established	Average utilization was 30%, standards were met Riparian utilization on Cottonwood Gulch was 58%, 10% Streambank disturbance and Bull Run 15% Improvements: 1 water development and 1 fence have been reconstructed Likely to not have decreased

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
			condition due to proper utilization and improvement construction.
JIMBALL	23-Jun-98	<p>Improve riparian conditions</p> <p><u>Vegetation:</u> key areas have been established</p> <p>Improvements: reconstruct 4 water development</p>	<p>Average utilization was 60%, standards were exceeded</p> <p>Riparian utilization on Pikes Gulch was 15%, 10% Streambank disturbance</p> <p>Pikes Gulch removed from pasture and used only as a trailing pasture.</p> <p>Improvements: 4 water developments have been reconstructed</p> <p>Possible decrease in condition due to overuse.</p>
JIMTOWN	23-Jun-98	No active grazing, used on a case by case basis in emergency situations and/or intermittent resource relief	No decrease in allotment conditions
BIG LOG	23-Jun-98	No active grazing	No decrease in allotment conditions
EAST-WEST FRENCH	23-Jun-98	<p>15% reduction</p> <p><u>Vegetation:</u> key areas have been established</p> <p>Improvements: reconstruct 5 water development, reconstruct upland exclosures</p>	<p>Average utilization was 35%, standards were met</p> <p>Improvements: 5 water developments have been constructed or reconstructed</p> <p>Likely to not have decreased condition due to reduction, proper utilization and improvement construction.</p>
MOORS MOUNTAIN	23-Jun-98	Improve riparian conditions	<p>Due to riding requirements in the plan, this pasture/allotment has not been grazed for two consecutive years</p> <p>Improvements: 1 water development was reconstructed and Trail # 263 out of the bottom of the Porcupine Creek drainage has been relocated, and the rehabilitation of the old trail and stream crossings have been completed.</p> <p>Likely to not have decreased condition due to rest and improvement construction.</p>
YORK HILLS	23-Jun-98	Combined with Nelson-	See Nelson-Favorite

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		Favorite to provide opportunities considering a rotation of both spring and fall grazing based on plant characteristics and water availability.	
HILGER	23-Jun-98	No active grazing	No decrease in allotment conditions
WILLOW CREEK	23-Jun-98	No active grazing	No decrease in allotment conditions
INDIAN FLATS	23-Jun-98	<p>Improve riparian conditions</p> <p><u>Vegetation:</u> key areas have been established</p> <p>Improvements: Construct 1 new fences</p>	<p>Average utilization was 45%, standards were met</p> <p>Riparian utilization on Pikes Gulch was 30%, 10% Streambank disturbance and 25% on Indian Creek, 10% Streambank disturbance</p> <p>Improvements: 1 fence has been reconstructed</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
GROUSE RIDGE	23-Jun-98	<p>Improve riparian conditions</p> <p><u>Vegetation:</u> key areas have been established</p> <p>Improvements: reconstruct 4 water development</p>	<p>Average utilization was 25%, standards were met</p> <p>Riparian utilization on Bowman was 30%, 10% Streambank disturbance and 25% on Fantail Creek, 10% streambank disturbance and 20% on Trout Creek, 10% Streambank disturbance</p> <p>Improvements: 1 fence not identified in the plan and 2 water development has been reconstructed</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
CELLAR-OGILIVIE	22-Sep-98	<p>Approximately 20% reduction in season and/or numbers</p> <p><u>Vegetation:</u> key areas have been established</p> <p>Improvements: a drift fence was built in 2002 to keep cattle drifting northward from</p>	<p>Average utilization was 35%, standards were met</p> <p>Improvements: 1 fence constructed</p> <p>Likely to not have decreased condition due to reduction, proper</p>

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		this allotment into the Marsh Creek allotment.	utilization and improvement construction.
AVALANCHE	28-Jan-00	20% reduction in numbers and season of use <u>Vegetation:</u> key areas have been established Improvements: reconstruct 8 water development	Non-use. no utilization data Improvements: 6 water developments have been reconstructed, 10 fences have been reconstructed because of fire in 2000. Likely to not have decreased condition due to reduction and improvement construction.
MAGPIE	28-Jan-00	12% reduction in season of use <u>Vegetation:</u> key areas have been established Improvements: reconstruct 6 water development and 5 proposed new water developments and 1 fence to be reconstructed, 6 fences proposed new construction.	Improvements: 3 water developments have been reconstructed, all fences identified on AMP were reconstructed after the fire in 2000. Likely to not have decreased condition due to reduction and improvement construction.
WHITES GULCH	28-Jan-00	Stocking is the same but season of use may vary <u>Vegetation:</u> key areas have been established Improvements: reconstruct 9 water development	Improvements: 7 water developments have been reconstructed, 2 fences were reconstructed but not identified in the AMP for reconstruction. Likely to not have decreased condition due to improvement construction.
TICK GULCH	28-Jan-00	No active grazing	No decrease in allotment conditions

Ongoing monitoring was summarized to begin to assess the success of allotment management plan implementation through utilization measurements as an indication of the success of the plans. In addition to Forest Service analysis, the work of a private contractor was hired by the Elkhorn working group to map rangeland conditions in the Elkhorns, including the North Crow and Kimber Gulch allotments. The first phase of this work was completed in 2005. The study entitled "Elkhorns Vegetation Study, Phase 1" can be found in the project file.

***Data Analysis Methods:***

Environmental analyses were completed for all the allotments included in the condition and trend portion of this element. Annual monitoring is assessed to determine whether livestock utilization is appropriate.

***Monitoring Results:***

Thirty-five allotments which had updated allotment management plans in the past 10 years were included in this analysis (some allotments were combined during the allotment planning process). Thirty-four of

the allotments were likely to not have decreased in condition, based on utilization, reductions and improvement construction as noted above. One allotment had a possible decrease in condition, based on utilization measurements. This represents 45% of the allotments on the Forest. It is reasonable to assume that this is a representative sample.

#### Variability Measure Discussion:

##### *Variability Measure:*

5% increase in acres with downward trend or a 5% decline in acres by condition class.

##### *Assessment:*

Of thirty-five allotments presented here, thirty-four are likely to not have decreased in condition, based on utilization, reductions and improvement construction as noted in the above table, while one allotment had a possible decrease in condition, based on utilization measurements. This is a representative sample of allotments across the Forest. 2.8% of the allotments possibly have a decline in acres by condition class. It is likely that the Forest is within the variability of this element.

Condition and trend is a longterm assessment. The above table shows various actions that were taken in the management update process. On those allotments where grazing reductions have occurred, it is reasonable to assume that condition and trend have improved as livestock grazing decreases with reduction in season or numbers. On allotments where grazing levels were maintained, actions such as developing new water sources, improved management techniques including herding and riparian fencing should result in improved conditions.

The next update to the plan where new inventory is collected is the true measure of this element. The information presented here can be used to indicate whether improvements can be expected from actions that have been taken but the true assessment can occur with the next analysis of the allotments that are shown in the above table.

##### *Actions in response to variability assessment:*

Continue annual utilization and permit compliance monitoring to ensure plans are being implemented appropriately. Plan and execute inventory updates on at least a 15 year interval. Ensure that baseline inventory is completed in order to have a comparison for trend.

#### Recommended Efforts:

Ensure that plans are updated and implemented on a scheduled basis. Ensure permit compliance through utilization monitoring.

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### **(D4.2) Conifer/Brush Encroachment**

#### Forest Plan Requirements:

Identify/determine encroachment by conifers/bush to grassland aspect.

##### *Intent*

Conifer encroachment is managed through the use of prescribed fire, sometimes coupled with mechanical treatment. Burning that has occurred in the past 10 years is addressed for this portion of the element.

**Data Sources:**

INFRA database, allotment inspection records, transect data, photo plots, wildlife surveys, and burn area monitoring, environmental documents, FSVEG. FSRAMIS was identified as a data source in the Forest Plan. This database has been replaced with the INFRA database, so it is not available or appropriate as a data source.

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Observational data, written records and FSVEG information were summarized for this element.

*Data Analysis Methods:*

Observational data have been summarized. No further analysis beyond summarization has been done.

*Monitoring Activity:*

No specific activities are accomplished at a Forest scale to determine changes for this element. A fire history study was completed on the east portion of the Elkhorns in 2005 (Barrett, ) that indicated substantial losses of grassland aspect have occurred for the past 100 years. Visual comparisons between historic photos (1930's and 1940's) and 1990 aerial photos indicate that conifers have increased while grasslands have decreased on a project by project basis.

Conifer encroachment is treated on a project-by-project basis. The following table shows the acres that have been treated by Ranger District from 1995 to 2005.

Treatment Year	Acres of Conifer Encroachment Treated			
	Townsend	Helena	Lincoln	Total Forest
1995	1203	Unknown	170	1373
1996	1187	unknown	2061	3248
1997	448	548	500	1496
1998	1443	814	412	2669
1999	950	541	105	1596
2000	623	35	0	658
2001	95	276	1090	1461
2002	490	781	1161	2432
2003	184	513	700	1397
2004	3402	1329	798	5529
2005	866	55	0	921
1995-2005	10891	4892	6997	22780 acres

In addition to controlled burns, the Forest has experienced three large wildfires in the past ten years. The Cave Gulch fire burned over 40,000 acres in 2000; the Maudlow-Toston fire burned approximately 10,000 acres on National Forest land in 2000; the Snow-Talon fire burned over 40,000 acres in 2003. The Cave Gulch fire in particular burned many acres of conifer encroachment. The other two fires burned relatively small acreages of conifer encroachment.

***Monitoring Results:***

22,780 acres of conifer encroachment have been removed in the past 10 years. Several thousand acres have likely been removed in wildfires.

**Variability Measure Discussion:*****Variability Measure:***

5% decline in acres with a grass aspect. 5% less of grass/brush to a conifer overstory.

***Assessment:***

There is no baseline to compare this element to, so it is not possible to make a direct comparison. The following logic was used to discuss the element.

Using data from the Forest master vegetation geospatial database, there are approximately 104,500 acres of grassland/shrubland, or areas that are dominated by grassland/shrubland but have 5-10% tree cover on the Forest. [Grasslands are defined in the database as areas with less than 10% tree canopy cover, and does not include rock dominated areas. Grassland and shrubland are not differentiated in the database, so are grouped together in this discussion.] Not all of the grassland acres have active encroachment, but conversely not all acres of conifer are included in this figure. It is assumed that this approximately balances out, so the figure of 104,500 acres of grassland will be used for this discussion. 22,780 acres of conifer encroachment treatment, shown in the above table, equals 22% of the grasslands on the Forest. To use a "worst case scenario" by assuming that at least 50% of the acres treated were actual conifer encroachment removal as opposed to burning open areas, or burning with low conifer mortality, approximately 10% of the conifer encroachment on the Forest was treated in the past ten years. With this set of assumptions, the variability of this element was met—there was less than a 5% decline in acres with a grass or sagebrush overstory.

***Actions in response to variability assessment:***

Continue to remove encroachment, where appropriate, to maintain or re-establish grassland and shrubland extent across the Forest.

**Recommended Efforts:**

The Forest should use the new VMAP product to identify areas of encroachment and establish a baseline for this element. One of the difficulties of this element is to define encroachment and what a grass aspect is. The level of encroachment, ie. the canopy cover of trees on encroached land, may be a more appropriate measure of this concern. Once a baseline for encroachment is established, the ability to measure change in canopy cover on those areas be possible, and meaningful.

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**(D5) Permit Compliance****Forest Plan Requirements:**

Permit Compliance

***Intent***

Insure livestock use complies with range readiness, proper utilization and permit requirements.

**Data Sources:**

Allotment inspections.

### Current Efforts and Findings:

Approximately 80-90% of the seventy-eight active allotments were checked either through range readiness or allotment inspections. Thirty-nine of the seventy-eight active allotments were checked for permit requirements this included monitoring riparian and upland, improvement responsibilities, etc... Approximately 40% of the allotments are checked for range readiness. These calculations are based on the following:

All 78 active allotments across the forest are categorized using A, B or C based on permittee compliance, AMP implementation or other factors such as unauthorized use. For "A" allotments (generally allotments that are continually in non-compliance, have T&E species that require a higher level of monitoring, AMP implementation or continual unauthorized use) a minimum mandatory documentation with Compliance Forms is required. "B" allotments (generally allotments that have been in non-compliance in the past but have changed management and are meeting standards or allotments that are borderline with compliance issues) will be administered to standard when "A" allotments have been taken care of. Allotment inspections will be documented in annual allotment diaries and may be summarized on Compliance Form. "C" allotments (generally allotments that have been in compliance, not stocked with livestock or don't have any major resource concerns, such as T&E species) will not be inspected unless all work is done on the A and B allotments.

#### *Documentation of monitoring methodology:*

The Forest Service Handbook, (FSH 2209.13 – Grazing Permit Administration, Chapter 10 – Term Grazing Permits) are guidelines that are following when issuing a permit, procedures on dealing with non-compliance issues and non-use, either resource protection or personal convenience non-use. Forest Plan Standards for allowable use for riparian and uplands are also used in conjunction with the Forest Service Handbook. Allotments with current Allotment Management Plans have more stringent utilization standards.

#### *Monitoring Activity:*

<b>Allotment Name</b>	<b>Compliance Issue: Range Readiness, Proper Utilization, Permit Rqmnts.</b>	<b>Action Taken: Notice of Non-compliance, Suspension, Cancellation, remove cattle from forest</b>	<b>Remarks:</b>
Blossburg	Streambank Trampling	Adaptive management	Action not taken because FS has been working with permittees to implement range management practices and or structures to help mitigate the stream bank concerns
Slate Lake	Bank trampling and other parameters	Adaptive management	Working on this issue, changes in fences, enclosures
Cellar Ogilvie	2004 – suspense for exceeding standards and poor distrubution	1 <sup>st</sup> year of suspension for 2004 grazing season	Permittee is doing better this year with regards to the area of concern
Tarhead	Permit Requirements	Notice of Non-Compliance	Permit Waived back to

<b>Allotment Name</b>	<b>Compliance Issue: Range Readiness, Proper Utilization, Permit Rqmnts.</b>	<b>Action Taken: Notice of Non-compliance, Suspension, Cancellation, remove cattle from forest</b>	<b>Remarks:</b>
1 permittee			the Forest Service 2005.
Whitehorse 1 permittee	Terms & conditions of permit for improvements	Notice of non-compliance, suspensions and cancellations and appeal	Permittee was in non-compliance for not maintaining their improvements by the time frame specified. They received a 25% suspension with time limit, cancelled that 25% gave them another 25% suspension and they finally responded and appealed the decision. Forest Supervisor gave them back 25% so their permitted numbers were for 22 pair instead of 44 (original).
Camas Creek	Proper Utilization and Terms of permit	2 <sup>nd</sup> year of suspension, began 2004	All amp objectives and terms and conditions of the permit were met.

***Data Analysis Methods:***

For 2005 there were 5 issues of permit compliance across the forest. Two were being dealt with by adaptive management (working with the permittee) on riparian utilization and streambank standards. One permittee was given a 25% suspension for two years based on exceeded utilization levels. One permittee received a notice of non-compliance for permit requirements and they waived the permit back to FS. One permittee was in non-compliance for not maintaining their improvements by the time frame specified. After several actions, their permitted numbers were reduced to 22 pair from the original 44 pair.

If we have a cool, wet spring, most allotments are checked for range readiness prior to livestock entering the forest. On normal years, allotments in higher elevations checked for range readiness.

Since the beginning of the drought cycle in 2000, the line officers have the authority to offer resource protection non-use. This allows the permittees to take non-use (less than 90% of permitted numbers or season of use) without it counting towards the 3 out of 4 years of personal convenience non-use in a 10 year period, to protect the resource. Many permittees have taken advantage of the resource protection non-use. The Townsend District had sixteen permittees that took resource protection non-use either in permitted numbers or season of use (going on late or coming off early). This gives the permittee the flexibility to do what is best for the resource. Many times, permittees are billed for full numbers and

season but if the precipitation does not happen, they are credited on the next year's bill for of amount of non-use they voluntarily took.

***Monitoring Results:***

There has been a 10% change from the annual operating instructions (plan) because of resource protection non-use but not from non-compliance issues. Six percent of the 78 active allotments had some kind of permit compliance issue as displayed in the table above.

**Variability Measure Discussion:**

***Variability Measure:***

10% +/- Change from annual plan

***Assessment:***

This resource element has been met across the forest for 2005 as demonstrated above.

***Actions in response to variability assessment:***

No actions are necessary as the element is being monitored and is within the variability measure.

**Recommended Efforts:**

Continue to offer resource protection non-use especially with the changing weather patterns. This gives the permittees flexibility to adjust where they need to for management of the livestock. This is also beneficial to the resource because it allows for longer deferred grazing periods or less animals on the allotment. During drought years, this also provides more forage for the wildlife if the permits are not stocked to their full potential.

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## **(E) Regulated Volume, Timber**

### **(E1) Regulated volume prepared for sale**

**Forest Plan Requirements:**

Volume prepared for sale

***Intent:***

The intent of this monitoring element is to insure that the base harvest schedule is followed and that the 10 year timber sale is adhered to.

**Data Sources:**

Data sources used to compile information for this element are Region 1 Timber Sale Program Statistics, Fiscal Year Cut and Sold Report and the Periodic Timber Sale Accomplishment Report (PTSAR). The Forest Plan identified the 10-year sale program, quarterly cut and sold, and Form 2400-27. The data sources listed previously have replaced these sources, and are more appropriately used for this report.

**Current Efforts and Findings:**

***Documentation of monitoring methodology:***

Review and summarization of data from data sources described above.

***Monitoring Activity:***

Helena Forest timber sale program statistics data is input into the Timber Information Management (TIM) database, managed at the Forest Level and compiled at the Regional Office. Monitoring is accomplished through maintenance of the TIM database and the Periodic Timber Sale Accomplishment Report (PTSAR).

***Data Analysis Methods:***

The FY05 offer was primarily sawlog volume associated with the Snow Talon Fire Salvage Timber Sale. This was sale offering was in response to a large scale wildfire and was added to and prioritized within our 5 year plan in FY04. The Helena Forest requested a volume target commensurate with expected output for FY05, however; due to deteriorate of material prior to sell, volume estimates were below initial field reconnaissance estimates.

***Monitoring Results:***

Timber sale program statistics indicate that in FY05, the Helena National Forest offered 14.2 MMBF (14.2 MMBF roaded, 0.0 MMBF inventoried roadless) of a 20.5 MMBF financed program, which included a combination of personal use firewood, post and pole, and commercial sawlog sales.

**Variability Measure Discussion:*****Variability Measure:***

Change (+/- 10%) in volume from 5-year base harvest schedule. No more than 25% of the sales located outside of scheduled 10-year plan.

***Assessment:***

Annual harvest volume prepared for sale and 5 year base harvest schedule variability exceeds +/- 10% of the Forest Plan base harvest schedule.

***Actions in response to variability assessment:***

In review of the decision flow diagram in the HNF Forest Plan, the variability exceeds acceptable limits and is a reoccurring variation. Direct effect (management oriented) on the Helena's ability to adhere to a 10-year schedule is due to the recent large scale wildfires, the National emphasis on ecosystem management and fuels related programs and less emphasis on maximizing timber production on timbered lands, thus resulting in fewer acres treated with the sole emphasis of timber production.

The Forest Plan identified a 10 year harvest schedule and identified projects to be implemented between 1986 and 1996. Since 1997, the Forest has established a 5 year harvest schedule, however; projects on the Helena over the last 5 years have been primarily salvage projects and were not initially considered as a contribution to this 5 year timber sale schedule or the base harvest schedule. Policy has established that the ten-year sale program is an upper ceiling rather than a required output and therefore, this deviation does not require a Forest Plan adjustment at this time.

**Recommended Efforts:**

Continue to maintain a 5-year timber sale schedule.

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**(E2) Timber assumptions****Forest Plan Requirements:**

Timber assumptions: volume, productivity, condition class, slope, recovery, logging, acres harvested are validated and assumptions are correct in the Forest Plan.

***Intent:***

The intent of this monitoring element is to insure that: 1) board foot/cubic foot ratios are correct, 2) volume/acre yield is correct, 3) working groups accurately reflect productivity, 4) condition class assignments are correct, 5) scheduled logging systems (cable, tractor and helicopter) are used, and 6) schedule of acres harvested is correct.

**Data Sources:**

Sources of data include sale reviews, silvicultural prescriptions, environmental documents, cruise summaries and the Forest Activity Tracking System (FACTS). The Forest Plan lists TSMRS as a data source. This database has been replaced with National FACTS database, which is the appropriate data source to use for this element.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Review and summarization of data from all available data sources described above.

***Monitoring Activity***

Item 1. Review cruise summaries and volume offered to determine board foot/cubic foot ratio and compare to projections in the Forest Plan, Item 2. Review cruise summaries and environmental documents and compare to projections in the Forest Plan to determine if volume/acre yield is correct. Item 3. Review working groups to ensure they accurately reflect productivity. Item 4 is monitored through stand exams and age projections associated with the recent analyses. Item 5: Scheduled logging systems (tractor and cable systems) to determine whether they are in use in approximately the same ratio as projected. Item 6: Determine whether schedule of harvest is correct. All items are to be measured annually for one sale per district and reported every 5 years.

***Data Analysis Methods:***

A shift in emphasis as described in E1 has also resulted in a shift of budgets. This emphasis shift also indirectly influences volume prepared for sale. Implementation of salvage harvest and fuels reduction projects for example yields lower volume per acre and generally may extend stand rotation. Silvicultural prescriptions are designed to focus leaving trees individually and in clumps within and adjacent to harvest units for snag recruitment, structural diversity and regeneration with no plans in the near future to remove them.

A sale review of the Grassy Bugs Timber Sale was completed by members of the Forest Leadership and ID Team. The purpose of this trip was to monitor implementation of the Grassy Bugs CE. The silvicultural prescriptions, decision memo, unit design, logging systems and volume estimates were considered in this review and results were consistent with the expectations of the Forest Plan for this type of treatment.

***Monitoring Results:***

In FY05 the Helena offered only one large timber sale and this was on the Townsend district.

Item 1 & 2: The Forest Plan projects a board foot/cubic foot ratio of 3.1/1.0 and an average volume/acre of 7.75 MBF. The sale specific FY06 analysis for Greyson Bugs Salvage is discussed in detail for this report.

Greyson Bugs Salvage – Townsend Ranger District

Items 1 and 2: Volumes offered for Greyson Bugs Salvage in FY06 had a board foot/cubic foot ratio of 2.02/1.0 and a average volume/acre of 6.4 MBF. Volume and yield tables are correct.

Item 3: Forest Plan working groups continue to reflect forest productivity associated with forest habitat type groups.

Item 4: Condition Class assignments do accurately reflect forest tree size classes.

Item 5: The Forest Plan estimates that 93% of all harvesting will be accomplished with tractor systems and the remaining 7% with cable. The Greyson Bugs Salvage was planned for 81% tractor and 19% cable. Existing roads were available to utilize cable systems and cable logging was deemed appropriate for this situation. This deviation in distribution from Forest Plan recommendations reflects the Forest priority to use existing roads where possible to implement logging activities.

Item 6: This sale was included in the schedule of harvest and acres were consistent with the projections in the Greyson Bugs Salvage Categorical Exclusion.

**Variability Measure Discussion:**

*Variability Measure:*

Sale reviews question validity of assumptions + or – 15 % of Forest averages.

*Assessment:*

Results of current board foot/cubic foot ratios indicate a lower ratio than originally predicted in the Forest Plan. This could be directly related to volume tables used in projections for the Plan and volume tables developed locally and used as part of the cruise program. Volume per acre projections in the Plan were primarily prioritizing regeneration harvest techniques and within the past 5 years the Helena has implemented primarily intermediate harvests and fire salvage which has resulted in a lower volume per acre than project in the Plan.

Condition Class assignments are descriptions of existing conditions in timbered stands based on a classification system maintained in the TSMRS database and utilized in the Forest Plan. TSMRS is no longer in use and its replacement, FACTS, does not include condition classes. Forest Plan condition classes are those found and defined in the FSH 2409.21e Timber Management Control Handbook. The classification assigns codes of 1-7 to timbered stands based on desirable stocking in relation to actual stocking as well as in terms of desirable tree species. Condition class is described briefly in appendix B of the Forest Plan EIS (B/13); the Forest Plan does not indicate the desirable abundance of condition classes nor assign guidelines. Instead, the classes are referenced as one of the criteria for assigning timber suitability and volume output estimates. Monitoring of this element would include verifying that the condition class assignment in TSMRS is appropriate based on site-specific analyses and prescriptions, thereby helping to validate the volume output assumptions developed for the Forest Plan. However, we do not track this element currently with respect to database information because the classification is no longer maintained. Instead, volume predictions and timber suitability are assessed through NEPA analyses, field exams, and prescriptions.

Although condition classes are not specifically monitored due to a change in classification schema used and database limitations, the intent of assessing condition class validity is to help assess timber suitability and volume predictions. This intent is met on the Forest through NEPA documentation, field exams, and detailed silvicultural prescriptions.

The Forest Plan EIS projects 1,940 acres of harvest per year and the harvest is monitored for a five-year period. In 2005, the Helena Forest awarded sales resulting in less than 200 acres. Deviations below Forest Plan projections are acceptable and will be re-evaluated in the up coming Forest Plan revision.

*Actions in response to variability assessment:*

No additional action is needed at this time.

**Recommended Efforts:**

Continue to evaluate all items of this element at the project level using all available information.

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**(E3) Silvicultural assumptions and practices**

**Forest Plan Requirements:**

Monitor silvicultural assumptions and practices.

*Intent:*

Silvicultural diagnoses, prescriptions, EA's, and FACTS are to be monitored in order to insure that 1) uneven-aged as well as even-aged management is applied to elk winter and summer range, retention zones and riparian areas, 2) rotation age and culmination of mean annual increment (CMAI) assumptions are correct, 3) silvicultural prescriptions follow management area standards, 4) silvicultural prescriptions precede all vegetative manipulation, and 5) silvicultural prescriptions achieve desired results.

**Data Sources:**

Silvicultural diagnoses, detailed prescriptions, NEPA documentation, FACTS database.

The Forest Plan lists TSMRS as a data source. This database has been replaced with National FACTS database, which is the appropriate data source to use for this element.

**Current Efforts and Findings:**

*Documentation of monitoring methodology:*

Review and summarization of data from all available data sources described above.

*Monitoring Activity:*

Ongoing review of all data sources listed was completed, including a review of the Forest's silviculture program. Silvicultural diagnoses and prescriptions provide information on appropriate silvicultural systems, silvicultural assumptions, and management area compliance. Post treatment monitoring, including evaluations by IDT members and the Regional Office, provide information on whether desired results were achieved. In 2005, this included a field site visit of the Snow Talon timber sale. All silvicultural prescriptions can be found in stand folders. Prescriptions were compared with assumptions in the Forest Plan.

*Data Analysis Methods:*

Silvicultural prescriptions are based on Forest Plan direction and management area standards during the design of the project; standards are discussed in every NEPA document as well as listed as part of each prescription (see examples in project file). During the silvicultural diagnoses phase of all projects, both unevenaged and evenaged management are considered as treatment options; utilizing all information available the silviculturist determines the most appropriate method. Clearcutting was only used when it was the optimal method.

The management focus for harvest prescriptions during this monitoring period has been to increase stand resiliency and forest health rather than maximizing growth and yield. Therefore, stands have not been necessarily harvested as soon as rotation age is reached or re-stocked to their CMAI. However, site capability and rotation age are considerations in prescriptions and current projects meet the intent of this standard. Reforestation surveys help assess assumptions concerning site capability.

Comparisons of prescriptions and the Forest Plan show that the Forest is designing prescriptions with an attempt to mimic the effects that natural disturbances that would have had in specific ecosystems. For the most part, unevenaged management is applied to warm and dry forests that were naturally thinned by fire, and evenaged management is applied to cool and moist forests that were naturally affected by historic stand replacement fires. Appendix H/1 of the Forest Plan specifies silvicultural practices by habitat type groups that include assumptions for rotation age, CMAI, harvest system, and reforestation requirements. Most of the areas harvested during this monitoring period fall in one of the Douglas fir habitat type groups, which generally indicate shelterwood systems and a rotation age from 120-150. While many of the harvest prescriptions for this monitoring year focused on salvage, these assumptions are correct and desired results are being achieved. Appendix M/1 of the Forest Plan provides guidance for all vegetation management practices occurring on the Helena National Forest including management guidelines for habitat type groups. These practices and guidelines are being implemented where vegetative management is occurring. In review of recently completed harvest prescriptions, conclusions described are accurate.

#### *Monitoring Results:*

- 1) Unevenaged management has generally been applied to warm and dry forests; no such projects occurred in 2005. In 2005, harvest projects occurred in Beaver Dry, Black Butte Salvage, and Maudlow-Toston Salvage timber sales. Beaver Dry prescriptions were mainly even-aged, and the salvage treatments focused on recovering dead timber. Even-aged management is often applied to higher elevation, cooler forests including areas used as summer range by elk. SMZ and retention zones have not been included in harvest activities for other resource considerations. These areas help provide snag habitat and reduce impacts to riparian ecosystems.
- 2) At this time, the Helena National Forest has found no indication that Forest Plan CMAI (culmination of mean annual increment) or rotation age needs to be adjusted. The Forest plan estimated rotation ages based on 95% of the CMAI (B/72).
- 3) Silvicultural prescriptions follow management area standards, as shown in NEPA documentation prepared during project planning. All prescriptions tier to the appropriate NEPA documentation which discusses how management area standards are met and applied.
- 4) Silvicultural prescriptions precede all vegetative manipulation, and are signed by a certified silviculturist. Silvicultural prescriptions for both harvest and prescribed fire are prepared during project analysis and implementation on the ground is consistently reviewed.
- 5) Silvicultural prescriptions are monitored during and after implementation to assess whether desired results were achieved so that adaptive management can be applied as is demonstrated in the documentation of field visits and reviews of harvest projects.

#### **Variability Measure Discussion:**

##### *Variability Measure:*

Silviculture program review questions the validity of silvicultural assumptions+ or – 15% of the Forest averages.

***Assessment:***

Current silvicultural prescriptions involve both timber harvest and prescribed fire. In 2005 harvest prescriptions being implemented included Beaver Dry, Black Butte Salvage, and Maudlow-Toston Salvage. Assumptions in the Forest plan are continually assessed for validity when compared to silvicultural prescriptions and post-treatment monitoring.

***Actions in response to variability assessment:***

No additional action is needed, for this monitoring period. The Forest is within the variability standard of + or - 15% of the Forest averages as described in the silviculture and timber assumptions in the Forest Plan.

**Recommended Efforts:**

Continue the involvement of silvicultural staff and prescriptions in any project that involves vegetative manipulation, including fuel reduction, range and wildlife vegetation manipulation projects. Prescriptions should continue to incorporate management area direction, rotation age, and CMAI during their development. Continue close silvicultural involvement in implementation and monitoring completed projects, including silvicultural reviews of timber sale preparation and administration. Monitor prescriptions for accomplishment of desired results by completing thorough post-treatment examinations.

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**(E4) Firewood removal****Forest Plan Requirements:**

Firewood removal

***Intent***

The intent of this requirement is to insure that potential firewood from timber sales and road building is made available to the general public before slash disposal.

**Data Sources:**

Post sale reviews

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Review timber sale areas after harvest activities are completed for availability of firewood for the public.

***Monitoring Activity:***

Forest personnel visit on-going and closed sale areas to view/evaluate firewood opportunities and monitor how the public is utilizing the firewood.

***Data Analysis Methods:***

Firewood is being offered to the public from slash piles in ongoing timber sales on the Forest. Current firewood opportunities are promoted by Forest personnel in the Snow Talon Fire Salvage, Black Butte Salvage, Grassy Bugs Salvage, Maudlow Toston Salvage and Cave Gulch Salvage timber sales.

***Monitoring results:***

Firewood has been made available from 100% of timber sales on the Helena National Forest. Press releases have been made in local newspapers to advise the Public of firewood gathering opportunities.

The recent large fires of 2000 on the Forest have increased availability of standing dead trees for firewood within all of these fire areas. There were no commercial firewood sales in FY 2005.

**Variability Measure Discussion:***Variability Measure:*

Annually firewood will be made available from 75% of all timber sales.

*Assessment:*

The Forest is within compliance with the variability measure for firewood management.

*Actions in response to variability assessment:*

No additional action is needed.

**Recommended Efforts:**

Continue proactive firewood management opportunities.

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**(E5) Size of openings****Forest Plan Requirements:**

Monitor size of openings

*Intent*

The intent of this requirement is to insure that forest management practices comply with the environmental analysis which insures that openings conform to Forest Plan standards.

**Data Sources:**

NEPA documentation, FACTS database, implementation, and post-harvest monitoring documentation from Silviculturist and IDT, silvicultural prescriptions

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Review and summarization of data from all available data sources described above.

*Monitoring Activity:*

Environmental documents and implementation are monitored by the Forest Silviculturist to insure that opening sizes conform to standards and final implementation acres are recorded in FACTS (query in project file). NEPA documentation was reviewed for sales and compared with accomplishments in FACTS to assess opening size and whether the process for requesting large openings was necessary and/or followed. In some cases post-harvest monitoring was performed by the IDT and/or Silviculturist; these documents are provided in the project file. Silvicultural prescriptions are reviewed to ensure appropriateness of openings and checked for consistency with the NEPA planning.

The Forest Plan specifies that openings will normally be 40 acres or less, and if this size is exceeded, a 60-day public review and Regional Forester approval is needed. The Timber Management, Silvicultural Practices Handbook (FSM 2470) provides further detail by specifying some exceptions. One such exception states that where natural catastrophic events such as fire or insect and disease attacks have occurred, 40 acres may be exceeded without the public review and Regional Forester approval provided the public is notified and the environmental analysis supports the decision. Other exceptions provide for

openings up to 60 acres without public review and Regional Forester approval, including cases where these openings reduce disturbances to other resources, occur in dwarf mistletoe or root rot areas, or best provide for visual quality objectives.

***Data Analysis Methods:***

Several projects, such as Snow Talon and Greyson, have recently had ID team and/or silviculturist reviews (project file). In these projects, implementation unit size was similar to the size analyzed in NEPA documents. Prescriptions and FACTS show that harvest accomplished is consistent with NEPA planning, and during this monitoring period no openings were created that required Regional Forester approval. No documentation shows unacceptable results of ID team or administrative review results with respect to opening size. Rationale for the increase in size relates to treatment areas "fitting the landscape" which results in reduced visual effect, decreased fragmentation and reduced long-term disturbance (as fewer entries are needed to manage vegetation). This is considered for all projects in the planning phase.

***Monitoring Results:***

In 2005, openings over 40 acres were created in the Maudlow-Toston fire salvage project. A shelterwood prescription was done on 84 acres and seed-tree prescription on 234 acres. This project occurred in wildfire areas, and fit into the exception above which does not require the 60-day public review and Regional Forester Approval. However, the Forest did scope with the public and provide requests to the Regional Office for this activity. Intermediate harvest such as shelterwood preparation, commercial thinning, or liberation harvest do not constitute openings. There are no notations in post-harvest monitoring documentation indicating that the results of harvest were not consistent with planned unit design. Clearcutting is only used when it is the optimal method, as documented in the NEPA decision and detailed silvicultural prescriptions.

**Variability Measure Discussion:**

***Variability Measure:***

Unacceptable results of an ID team or administrative review.

***Assessment:***

The Forest is within stated variability for this element.

Regional Forester approval is obtained where openings exceed 40 acres and the rationale for the larger openings is disclosed in the environmental document. Regional Forester approval is not required for projects where natural catastrophic events such as fire, windstorms, insects and disease have occurred provided the public is notified in advance and the environmental analysis supports the decision.

***Actions in response to variability assessment:***

Within stated variability, no additional action is needed.

**Recommended Efforts:**

Continue compliance with the requirements of the Helena Forest Plan with regard to opening size.  
Continue to treat forest landscapes at the scale of the environment.

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**(E6) Regenerated yield projections**

**Forest Plan Requirements:**

Regenerated yield projections.

***Intent***

Insure that regenerated yield projections are correct.

**Data Sources:**

Permanent plot records, FACTS database, silvicultural prescriptions

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Review and summarization of data from all available data sources described above.

***Monitoring Activity:***

The FACTS database was queried for plot installation or plot measurement activity. In addition, the database was checked for stocking survey results as a surrogate for permanent plot data. Prescriptions are written and reforestation measures prescribed considering yield projections.

***Data Analysis Methods:***

Thirty-three permanent growth plots have been established across the Forest, 19 since 1986. For consistency in data collection across the Region, the Regional Office took responsibility of establishment and re-measurements of the permanent growth plots. At this time they evaluated and stratified all plots across the Region for similarities in habitat type and treatment. The RO determined it was no longer feasible or necessary to re-measure all plots on every Forest. Consequently, similar habitat types and treatment types were deleted from the measurement program. The plots have been established and monitoring has been ongoing although the Region has not been able to visit the stands as frequently as originally intended.

Based on stocking surveys, the Forest is generally successful in meeting reforestation goals as prescribed using our current knowledge of growth and yield. Where regeneration is unsuccessful, prescriptions are adjusted and adaptive management used.

***Monitoring Results:***

No permanent growth plots were established or measured in 2005. While stocking surveys cannot be used as data to compare with growth and yield projections, they do provide general results of stocking success in regenerating stands. In 2005, 2,503 acres were surveyed; of this, no regeneration failed.

**Variability Measure Discussion:*****Variability Measure:***

Within 5 years, less than 50% accomplishment of scheduled permanent plots. During the first decade (of the Plan) 60 permanent plots were to be established.

***Assessment:***

The procedure for analyzing growth and yield modeling has changed regionally. Regenerated yield projections are monitored and adjusted at the regional level based on Regional data derived from the permanent growth plot results. Due to the fact that the Region is not currently measuring permanent plots, we cannot report specific comparisons or adjust growth and yield models. Per the Forest Plan variability measure, more than 50% of the assigned plots have been established. We are currently past the first decade since the Plan. The Forest is using the best information available to meet the intent of this monitoring item (ensuring sustainable forest production) through careful prescription writing and post-harvest surveys. We are meeting the intent of this element.

***Actions in response to variability assessment:***

Within stated variability, no additional action is needed.

**Recommended Efforts:**

Continue to work with the Regional Office with growth and yield monitoring; continue to monitor regeneration and apply observations to future silvicultural prescriptions.

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**(E7) Reforestation practices and assumptions****Forest Plan Requirements:**

Monitor reforestation practices and assumptions

***Intent:***

Silvicultural prescriptions, reforestation records, post sale administrative review and FACTS are monitored to insure that 1) regeneration is obtained within 5 years after final harvest cut, and 2) scheduled planting is accomplished.

**Data Sources:**

FACTS database, silvicultural prescriptions, post sale administrative review, stocking surveys, stake row surveys, post-harvest monitoring and exams. The Forest Plan lists TSMRS as a data source. This database has been replaced with National FACTS database, which is the appropriate data source to use for this element.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Review and summarization of data from all available data sources described above.

***Monitoring Activity:***

The FACTS database was queried to show areas in need of regeneration, reforestation status and results of stocking surveys, and planned versus accomplished planting (project file). Prescriptions are reviewed in conjunction with surveys to assess validity of assumptions and success of regeneration. Stake rows are performed on limited areas and are mainly used to assess the performance of nursery stock; however, they also provide some information in general terms of monitoring reforestation success.

***Data Analysis Methods:***

We use exam information to compare with desired/targeted reforestation conditions and to track reforestation as well as harvest accomplishments. This information is compiled and available in FACTS. The Regional Office generally conducts an annual review of reforestation indices, however, this review was not accomplished for 2005 due to the transition to FACTS so are not available for analysis for this monitoring period.

In 2005, 416 acres were planted in harvested areas (69% of the projected 600 acres per year in the Forest Plan); all planting occurred in harvest areas. Planting usually occurs in the first two years after completion of harvest. When plantings are not accomplished, it is due to lack of funding, harvest units not being completed, or unexpected amounts of natural seedlings found in pre-planting surveys. The sites are evaluated and re-scheduled for planting or natural regeneration and surveys. In general sites that are regenerating due to wildfire are programmed for natural regeneration over longer timeframes.

### ***Monitoring Results:***

All silvicultural prescriptions specify whether a harvest unit requires regeneration; if so, the method of natural or artificial regeneration is prescribed based on the most cost effective way of meeting sustainability goals. Stands treated with regeneration harvest are measured with systematic stocking surveys 1, 3, and 5 years after site preparation or planting to monitor reforestation. In the event of a natural regeneration failure, timely planting is scheduled. In addition to harvest units, stands regenerated after wildfire are also monitored (with emphasis placed on timber management areas) to ensure re-stocking; failures in these areas are also scheduled for planting as funding allows. The FACTS database contains information on scheduled natural regeneration and planting, reforestation status, and accomplishments.

FACTS was queried to assess the status of regeneration harvest units completed 5 years ago (project file). For 2005 monitoring, this included stands that had a final regen harvest in 2001; of the stands that were planted (78 acres), 44% are certified with the remaining progressing toward certification. Of the stands that were naturally regenerated (57 acres), 100% are certified. This shows that the Forest places the investment of planting on the harsher sites where regeneration is more difficult; these are sites where regeneration can be successful but takes a few years to grow to prescription specifications. There are no regeneration failures from these harvests. An additional 406 acres were planted in 2001 in areas with no timber harvest as a fire restoration treatment; of these, only 34 are certified. Planting has been accomplished as recommended in silvicultural prescriptions and post harvest monitoring exams (see project file for queries). Planned activities in prescriptions and changes as a result of surveys are entered into FACTS each season. In 2005, 495 acres total were planned and 416 were accomplished (87%); of the areas that were harvested, 443 acres were planned and 416 accomplished (94%). These plantings occurred in the Baldy Eight, Beaver Dry, Cave Gulch Fire Salvage, Poorman, and Wagner Atlanta harvest areas.

### **Variability Measure Discussion:**

#### ***Variability Measure:***

The Forest Plan projects 600 acres of tree planting per year with (1) acceptable variability of less than 75% of scheduled accomplishment in a five year period and (2) less than 50% accomplishment in any one year. Overall, there will be no more than plus or minus 10% in scheduled planting over a five year period.

#### ***Assessment:***

The Forest meets the variability requirement of planting at least 50% of the projected acreage per year; in 2005, 416 acres were planted which is 69% of projected. Accomplished planting is within 10% of planned planting; 94% of harvested areas planned were accomplished although only 87% of all areas planned (including fire areas that were not harvested) were accomplished. The plantings not accomplished in 2005 were in areas not harvested but killed by wildfire and located in the suitable timber base.

The tree planting program on the Forest is reflective of the timber sale program. The annual sale quantity is a ceiling, and the planting program is dependent on harvest to attain its ceiling. Harvest of active timber sales is sometimes delayed by market forces or natural events such as severe fire seasons and consequently the planting is delayed. Stands in fire salvage sales have been planted, but funding for reforestation of all burned lands is generally not available.

#### ***Actions in response to variability assessment:***

No additional action is needed.

**Recommended Efforts:**

Continue implementation of recommendations from silvicultural prescriptions and reforestation exams to reforest stands to meet the 5-year regeneration time frame. Plant trees to meet reforestation requirements, as needed.

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**(E8) Timber stand improvements and assumptions****Forest Plan Requirements:**

Monitor timber stand improvements and assumptions

*Intent:*

Insure scheduled TSI projects are accomplished.

**Data Sources:**

FACTS database, silvicultural prescriptions and accomplishment reports

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Summarization and review of data from all available data sources described above.

*Monitoring Activity:*

Reports were queried from FACTS for planned and accomplished TSI activities (see project file). Prescriptions, where available and appropriate, were assessed.

*Data Analysis Methods:*

The FACTS query showed areas scheduled to be thinned during this monitoring period; this amount averages to 260 acres per year, nearly the quantity predicted in the Forest Plan. This is attributed to thorough record keeping and long-term database maintenance of planned activities. However, all planned thinning lies within areas currently mapped as potential lynx habitat.

*Monitoring Results:*

No thinning was done in FY 2005 due to a lack of funding and changing management policies concerning lynx habitat.

**Variability Measure Discussion:***Variability Measure:*

The Forest Plan projects 280 acres of pre-commercial thinning per year with (1) less than 75% accomplishment of scheduled TSI in 5 years, or (2) less than 50% accomplishment per year.

*Assessment:*

Since the Canada Lynx has been listed as a threatened species under the Endangered Species Act the timber stand improvement program within its habitat has been "on hold", awaiting the thinning treatment recommendations from the Northern Region Lynx Conservation strategy. Most of the stands scheduled for pre-commercial thinning are encompassed by the habitat needs of this species, per current management direction. In addition, there has not been funding for TSI projects in recent years. A deviation of management practices is observed.

Even considering the relative abundance of acres harvested, the Forest is not compliant with the TSI objective defined in the Plan. The Forest is not compliant with the acceptable variability of less than 75% of scheduled accomplishment in a five year period. The Forest has accomplished 0% this goal. Annually the Forest has accomplished less than 50% of the thinning objective.

*Actions in response to variability assessment:*

No additional action is needed at this time.

**Recommended Efforts:**

Once the lynx amendment for Northern Region is completed, assess the appropriateness of pre-commercial thinning projects in accordance with direction. The amendment should be finalized in 2007. A database review of pre-commercial thinning opportunities has been conducted to implement thinning in areas of greatest need. All TSI projects within Lynx habitat are pending. Continue to consider and prescribe pre-commercial thinning as appropriate in silvicultural prescriptions.

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**(E9) Lands suitable for timber production**

**Forest Plan Requirements:**

Lands suitable for timber production.

*Intent*

Evaluate the accuracy of suitable lands classification in the Forest Plan; periodically re-examine lands identified as not suited for timber production to determine if they have become suited and could be returned to timber production.

**Data Sources:**

Data sources include environmental analyses; stand exams, project plans, and timber planning process.

**Current Efforts and Findings:**

*Documentation of monitoring methodology:*

Review and summarization of data from all available data sources described above.

*Monitoring Activity & Methodology:*

Suitability is considered during the preparation of site-specific silvicultural prescriptions. Post-fire assessments and stocking surveys are used to assess the re-stockability of lands currently in the suitable base that have not been recently harvested; this process is ongoing for the large fires of 2000 and 2003. Finally, stocking surveys, administrative reviews, and other post-harvest monitoring of harvest areas are used to determine if timber suitability assumptions in terms of re-stocking have been met. In cases where failures have occurred or re-stocking cannot be achieved, the need to remove the area from the suitable timber base is assessed. Review of Forest Plan amendments, specifically, Amendment #'s 5, 8, 9 and 18, and environmental documents was completed to insure consistency with land suitability as described in the Forest Plan.

*Data Analysis Methods:*

The suitability stage I analysis was used to evaluate lands classified as suitable and unsuitable on the Helena National Forest. The 5-step analysis includes: analysis of lands capable of producing at least 20 CF per acre per year, available for timber production, review of technology available to produce timber without irreversible resource damage and limitations on reforestation. Site-specific Forest Plan

amendments to modify suitability have been completed for 4 environmental analyses since 1986 (238 acres added to suitable, 100 acres removed). None have occurred in this planning timeframe. Field exams have been conducted extensively to determine the regeneration ability of both suitable and non-suitable timber lands in recently burned lands (since 2000). At the completion of this exercise and following the development of prescriptions, the need for an additional amendment to remove or add areas to the suitable base will be assessed, specifically for burned areas where natural recovery is the best silvicultural practice and for failures from historic sales where re-stocking cannot be assured.

Harvest in non-suitable management areas is well documented and analyzed in NEPA documents and silvicultural prescriptions and have been found to meet all Forest Plan objectives and guidance relative to harvest on non-suitable lands. The need for Forest Plan amendments for projects is assessed during the NEPA planning phase and no such amendments have been proposed or accomplished during this monitoring period.

*Monitoring Results:*

No silvicultural harvest prescriptions were prepared in 2005 which included site specific recommendations to change suitable timber lands. However, harvest has occurred in management areas considered not suitable for timber during the monitoring period (318 acres in 2005). In all areas, re-stocking was assured and harvest was used to achieve other resource objectives; these objectives are articulated in NEPA and silvicultural prescriptions.

**Variability Measure Discussion:**

*Variability Measure:*

+/- 5% change in acreage of suitable lands.

*Assessment:*

A review of the amendments for the Forest Plan was completed. Amendments 5, 8, 9, and 18 contained changes to existing Forest Plan management allocations.

The Forest is within variability measures for this element for the monitoring period FY 2005. Lands specified as suitable in the Forest Plan total 251.6 thousand acres; past amendments have decreased this allocation by 100 acres, and increased it by 238 for a net increase of 138 acres. This represents less than 1% of the total allocation. No changes have occurred during this monitoring period, thereby meeting the variability standard of + or - 5% change in acreage.

*Actions in response to variability assessment:*

Within stated variability, no additional action is needed.

**Recommended Efforts:**

Continue to evaluate land suitability at the project level as well as assessing wildfire areas and past regeneration failures, and recommend Forest Plan amendments as necessary.

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## **(F) Soil and Water**

### **(F1) Compliance with local, state, and Federal water quality standards**

**Forest Plan Requirements:**

Monitor for compliance with local, state and Federal water quality standards.

***Intent***

Insure compliance with local, state, and Federal water quality statutes.

**Data Sources:**

Flow measurements and measurement of selected water quality parameters (24 stations) throughout the Forest. Flow measurements and measurement of selected water quality parameters are monitored throughout the forest. Ten percent of timber sales or other projects that create soil disturbance are to be monitored annually. Activities not meeting water quality standards, or that would lead to long-term watershed degradation, would lead to action.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Sediment samples were collected using ISCO automated sediment samplers or a DH-48 suspended sediment sampler. Sediment samples were processed in the lab using standard filtration methodologies. Bedload was obtained using a standard helly-smith bedload sampler. Flow measurements were obtained using a standard AA flow meter following USGS methodologies. Stream stage was obtained by either making observations on a standard stream gage or by an automated aqua-rod stage recorder.

Youth Forest Monitoring protocols are outlined in the Youth Forest Monitoring Program for 2005 publication.

***Monitoring Activity:***

The Youth Forest Monitoring program for 2005 monitored seven different streams on the forest for temperature, pH, dissolved oxygen, conductivity, and macroinvertebrates. In addition, channel cross sections, pebble counts, and sinuosity were done. Core sediment samples were taken on an additional two streams.

Monitoring of the Toston/Maudlow fire and salvage sale also continued with water quality stations on Deep Creek and Sulphur Bar Creek. Flow measurement, suspended sediment samples and bedload were collected for both sites, An automatic stage recorder and ISCO sediment sampler were operated at the Deep Creek site.

Monitoring also occurred on Magpie Creek as part of the negotiated settlement for the Cave Gulch fire and salvage sale. Discharge, suspended sediment, and bedload were collected at least six times on the rising and falling portion of the hydrograph.

In anticipation of the Snow-Talon salvage sale the water quality monitoring station at Copper Creek was reestablished in 2004 and continued for the 2005 season. Flow measurement, temperature, suspended sediment samples and bedload were collected. An automatic stage recorder and ISCO sediment sampler were also operated at this site.

***Data Analysis Methods:***

Stage-discharge relationships using standard regression analyses were developed for streams where we had automatic stage recorders. Hydrographs were then developed for those stations. Once flow relationships and hydrographs were developed standard regression analysis of flow and sediment were run. All data was put into EXCEL spreadsheets and various graphs produced.

Analysis procedures for the Youth Forest Monitoring program are outlined in their yearly report.

***Monitoring Results:***

There are 31 water quality stations that have been established on the Forest that we have used in various years to monitor the majority of our timber sale and other major projects. This has been supplemented with various TMDL inventory and monitoring efforts, our "Youth Forest Monitoring Program", PIBO inventory and monitoring and monitoring done by other agencies such as DEQ and EPA on the Forest.

The Youth Forest Monitoring concluded that some of the streams that were monitored had improved in health, while the health of other streams had declined. However, according to our data, the overall health of the streams we visited in the HNF has improved. The erosion around most of the creeks seems to have decreased due to the increase in riparian vegetation. There was a high amount of diversity in the macro invertebrates in all of the streams. This overall improvement in stream health is a good sign, but the creeks we went to were not completely healthy. Cattle are still having a heavy impact on most of the streams. Many of the creeks had hummocks and banks that seemed trampled. The reason we may not have found large amounts of silt in the water is because of the heavy rains we received this spring that filled the creeks. The fast water in these streams could have washed the silt, and evidence of erosion, downstream.

For Landers Fork and Beaver Creek we concluded that they have good spawning habitats as indicated by the low amount of fines in the spawning gravels. However, we are not sure if the composition of these streams are improving or getting worse because this was baseline data.

The sediment analysis for the Toston/Maudlow salvage sale indicated that the amount of total sediment was significantly less (15% less) than what it was in 2004. 2004 showed even greater reductions from 2003 which was the peak in terms of sediment. The stream showed overall improvements and effects from the salvage logging appear to be negligible.

Monitoring on Magpie Creek demonstrated that the amount of sediment per unit of discharge was significantly more than what it was in 2004. This is primarily a result of rains causing a road washout in upper Magpie Gulch.

Copper Creek showed surprisingly small amounts of sediment coming from the burned landscape. It was far less than anticipated and Copper Creek remained clear except for one rainstorm, which produced a large percent (28%) of the total sediment load for the year in one day.

**Variability Measure Discussion:*****Variability Measure:***

Variability which would initiate action- Activities not meeting water quality standards or that would lead to long-term watershed degradation

***Assessment:***

The Forest is within compliance with the variability measure for compliance with local, state and Federal water quality standards. The one exception would be Magpie Gulch which showed high sediment levels compared to previous years.

***Actions in response to variability assessment:***

Within variability, no action is required for most of the sites. BMP audit of Cave Gulch Salvage was done in 2006 and corrective road drainage planned.

**Recommended Efforts:**

Continue with Youth Forest monitoring efforts and the four water quality stations listed above.

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**(F2) Soil and water improvement projects****Forest Plan Requirements:**

Soil and water improvement projects

*Intent*

To eliminate backlog of soil and water restoration acres by year 2000.

**Data Sources:**

Project EAs and accomplishment reports. Soil and water improvement projects are monitored through accomplishment reports to eliminate backlog of soil and water restoration acres.

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Monitoring methodology included inspections by COR and CO to assess whether the project was proceeding according to the contract. Visits were also made by the Forest hydrologist to document progress on the projects.

*Monitoring Activity:*

The Grouse Gulch watershed restoration project associated with the Cave Gulch salvage sale was monitored this year as well as the Snow Talon jammer trail rehabilitation.

*Data Analysis Methods:*

This watershed restoration projects were accomplished.

*Monitoring Results:*

We have been within 5% of our watershed target for every 5-year period. It should be noted, however, that the projected watershed improvement schedule listed in the Forest Plan does not have a direct link to the annual watershed target each year. The watershed improvement schedule is mainly a list of road improvements and watershed dollars cannot be spent on system road improvements. The watershed targets that are given to the forest are not associated with these road improvements. It should also be noted that the list of watershed/road improvements has an overall compliance of approximately 63%. The first 5-year period had a compliance of 85%, but the following five-year periods showed a compliance of 62%, 59% and 74% respectively. Most of the abandoned mine restoration listed in the watershed improvement schedule has been accomplished.

**Variability Measure Discussion:***Variability Measure:*

Variability which would initiate action - < 80% accomplishment of target in 5 year period.

*Assessment:*

The Forest is within compliance with the variability measure for compliance with Soil and water improvement projects.

***Actions in response to variability assessment:***

Within variability, no action is required.

**Recommended Efforts:**

Continue to monitor project next year to assure that it is adequately vegetated.

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**(F3) Productivity changes in sensitive soils****Forest Plan Requirements:**

To insure that management practices do not adversely affect soil productivity, EA's, review of proposed activities, field examinations and laboratory testing are used to monitor 10-15 sites annually.

***Intent:***

To insure that management practices do not adversely affect soil productivity

**Data Sources:**

EA's, review of proposed activities, field examinations and laboratory testing

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Soil science personnel conducted a field inventory of existing soil conditions within a selected sample of past harvest units in Cabin Gulch Vegetation Project Area. The sample was purposive: clearcut harvest units with "sensitive" soil types were targeted for review, because these areas typically see the greatest impact to soils. The field evaluation was conducted using Howes' disturbance classification methodology (2000) for assessing magnitude of soil disturbance. The sampling spatial design consisted of a randomly-oriented grid or transect sample pattern, with sample points spaced at intervals of 66 feet. At each sample point field personnel evaluated soil physical evidence indicating soil compaction, displacement, rutting, severe burning, surface erosion, mass wasting and ground cover. Based on observations of the soil physical evidence, a numerical rating from Howes' classification was assigned to characterize degree of soil disturbance at each sample point: class 0 representing undisturbed; classes 1 to 2 representing slight to low disturbance; class 3 representing moderate disturbance; and classes 4 to 5 representing high to severe disturbance. Howes' classification assumes that soil disturbance rated class 1 or 2 does not constitute detrimental soil disturbance; whereas, soil disturbance rated class 3, 4 or 5 is considered detrimental according to the definitions described in the Region 1 soil quality standards (USDA Forest Service 1999).

For all sites evaluated, soil bulk density was measured to provide a quantitative evaluation of magnitude of soil compaction. Soil bulk density samples were collected using the standard core sample method (Blake and Hartge 1986). To aid in describing spatial variability, triplicate bulk density cores were collected from the field for one sample point representing each of the following disturbance levels within the harvest unit: slight to low, moderate and high to severe disturbance (if present). For comparison, triplicate bulk density cores were also collected in the field from one undisturbed sample point in an adjacent, unmanaged area with similar soils. Field core samples were analyzed in the laboratory to determine soil bulk density.

Results of FY05 soil monitoring are documented in the Existing Condition section of the Soil Resources Specialist Report for Cabin Gulch Vegetation Project Draft Environmental Impact Statement.

***Monitoring Activity:******FY05 Monitoring Activity 1:***

Forest soil science personnel conducted field assessments of soil conditions in past harvest areas within the Cabin Gulch Vegetation Project Area. Areas sampled included twelve past timber harvest units, and were compared to samples from adjacent un-harvested areas, which served as the baseline data. Data from these field reviews serves as information to document current soil conditions, and to compare for trends in soil conditions resulting from future implementation of vegetation management activities.

***FY05 Analysis 1:***

Documentation of the findings from these field reviews conducted during summer and fall 2005 is on file at the Helena National Forest Supervisor's Office. This report includes documentation of the monitoring methodology, data collected, and results of the monitoring data analysis. Key conclusions are recounted below in the "FY05 Within Forest Plan Variability" summary.

***FY05 Monitoring Activity 2:***

Soil monitoring was conducted in three post-fire salvage harvest units within the Maudlow-Toston Post-fire Salvage Sale Area to assess implementation and effectiveness of key Best Management Practices for soils following salvage harvest. This soil monitoring was implemented through a Region 1 Soil Administrative Study in partnership with the Rocky Mountain Research Station (USDA Forest Service Research Branch) in Moscow, Idaho.

***FY05 Analysis 2:***

Soil monitoring data collected in the Maudlow-Toston Post-fire Salvage Sale Area, as part of the Region 1 Soil Administrative Study, is currently being compiled at the Rocky Mountain Research Station (RMRS) in Moscow, Idaho. Following completion of the field monitoring for this regional administrative study in summer 2005, soil data from the Helena National Forest is being analyzed by research scientists at RMRS along with soil monitoring data from other National Forests in Region 1. RMRS scientists plan to publish results of this administrative study in a general technical report in FY07.

***Data Analysis Methods:***

Laboratory data from soil bulk density cores was entered into an Excel spreadsheet to calculate soil bulk density values. Soil bulk density values were then exported from the Excel spreadsheet into SPSS statistical software. SPSS was used to conduct a One Way Analysis of Variance (ANOVA), comparing soil bulk density means representing each disturbance class against mean undisturbed soil bulk density values.

***Monitoring Results:***

Because The Forest Plan provides no additional detail on how this measure of soil variability is to be evaluated, guidelines on how to measure soil variability, which are documented in Forest Service Manual 2500, Chapter 2550 - Soil Management (FSM 2500, R-1 Supplement 2500-99-1, Effective 11/12/1999), are used for this assessment.

FSM 2500 directs that the measure for changes in soil productivity should be applied to determine both the magnitude of change in site-specific soil properties and the amount of area affected by change. This direction in FSM 2500 is used for specifying how the Forest Plan measure of soil variability (i.e. 20%) should be evaluated:

- When the magnitude of change in site-specific soil properties exceeds 20% compared to baseline conditions in unmanaged areas, the magnitude of soil impact is considered "detrimental".
- When "detrimental" soil impacts affect more than 20% of an activity area (i.e. a timber harvest unit), the amount of area affected by detrimental soil impacts exceed the Forest Plan measure of soil variability.

For monitoring in Cabin Gulch Vegetation Project Area, both the magnitude and extent of the following types of soil disturbance were evaluated in the field using Howes' methodology: compaction, rutting, displacement, severe burning, accelerated erosion, and mass wasting. The magnitude of soil compaction was also evaluated by collecting soil bulk density core samples from the field and analyzing those samples in the laboratory. The field evaluation of magnitude of soil compaction was then statistically correlated to these soil bulk density samples.

In past timber harvest units within the Cabin Gulch Vegetation Project Area, results of analyzing soil bulk density samples in the laboratory correlate the magnitude of soil compaction with field data, which is one of several types of soil disturbance evaluated. With the one-way analysis of variance (ANOVA) tests at a 95% confidence interval, 3 of the 12 monitoring plots showed statistically significant change in soil bulk density for soils disturbed by skid trails and logging roads associated with past harvest compared to undisturbed soils (Table F3-1). This statistically significant change in soil bulk density indicates the magnitude of soil compaction resulting from past harvest activities constitutes detrimental disturbance for these three harvest units.

In assessing the amount of area affected by all types of detrimental soil disturbance (i.e. compaction, rutting, displacement, severe burning accelerated erosion, and mass wasting) in past timber harvest units within Cabin Gulch Vegetation Project Area, results of this monitoring show that the Forest Plan measure of soil variability (i.e. 20%) is exceeded on all but two of the twelve sites evaluated (Table F3-2). The mean value for aerial extent of moderate to severe soil disturbance on all twelve plots was 28%, and ranged from 16% to 40%.

Five of the Cabin Gulch monitoring plots assessed areas which were harvested prior to adoption of BMPs in 1988. The mean value for aerial extent of moderate to severe soil disturbance on these 5 plots was 27%, and ranged from 20% to 33%.

Five other Cabin Gulch monitoring plots assessed areas which were harvested in 1988 and 1989 during the transition period when BMPs were adopted and first being implemented. The mean value for aerial extent of moderate to severe soil disturbance on these 5 plots was 31%, and ranged from 21% to 40%. This data suggests low effectiveness of BMP implementation during the first couple of years after BMPs were adopted.

One monitoring plot assessed an area harvested both in 1984 and again in 1994. The cumulative aerial extent of moderate to severe soil disturbance with two harvest entries on this plot was 32%. This data suggests low effectiveness of BMP implementation in harvest units with combined effects of two timber harvest entries: the first timber harvest entry occurred prior to 1988 and a second timber harvest entry occurred after 1988.

Finally, one monitoring plot assessed an area harvested with a single entry after 1989. The aerial extent of moderate to severe soil disturbance on this plot was 16%. This data suggests improved effectiveness of BMP implementation over time.

In conclusion, results of this monitoring document the magnitude of soil compaction seen in bulk density samples is statistically significant, and is thus considered "detrimental" soil disturbance, in 3 of the 12 sites evaluated. The aerial extent of all types of soil disturbance (i.e. compaction, rutting, displacement, severe burning, accelerated erosion, and mass wasting) "detrimentally" affects more than 20% of the area in all but two evaluated units, one harvested prior to adoption of BMPs and one harvested after adoption of BMPs in 1988.

<b>Table F3-1 Bulk Density Data Statistical Analyses For Soil Monitoring in Past Harvest Areas, Cabin Gulch</b>				
<b>Plot Number</b>	<b>Homogeneity of Variance Significance (95% Confidence)</b>	<b>ANOVA Significance (95% Confidence)</b>	<b>Post Hoc Test – Multiple Comparison of Differences in Means (95% Confidence)</b>	<b>Total Number of Samples</b>
05NS001	.035 = Significant difference	.302 = no significant difference	No significant difference	12
05NS002	.025 = Significant difference	.362 = no significant difference	No significant difference	12
05NS003	.041 = Significant difference	.373 = no significant difference	No significant difference	12
05NS004	.115 = no significant difference	.941 = no significant difference	No significant difference	12
05NS005	.653 = no significant difference	.939 = no significant difference	No significant difference	12
05NS006	.187 = no significant difference	.226 = no significant difference	No significant difference	12
05NS007	.016 = Significant difference	.010 = Significant difference	Significant Differences between Howes' Classes 0 & 5	12
05NS008	.021 = Significant difference	.103 = no significant difference	No significant difference	12
05NS009	.408 = No significant difference	.692 = No significant difference	No significant difference	12
05NS010	.568 = No significant difference	.853 = No significant difference	No significant difference	12
05NS011	.064 = No significant difference	.006 = Significant difference	Significant Difference between Howes' Classes 0 & 3	12
05NS012	.065 = No significant difference	.060 = no significant difference	Significant Difference between Howes' Classes 0 & 5	12

**Table F3-2  
Cabin Gulch Vegetation Project Area – Field Data in Past Harvest Units**

Monitoring Plot Number	Timber Stand ID Number	Year of Past Harvest	Method of Past Harvest	Number of Survey Transects for Coarse Woody Material	Coarse Woody Material >3 inch diameter (Tons / Ac.)	Number of Field Sample Points	Number of Field Sample Points w/ Howes' Class 3-5	% Field Sample Points w/ Mod. - Severe Soil Disturbance	LANDTYPE 1st Comp.	LANDTYPE 2nd Comp.
05NS011	12201005	1973	Clearcut	7	1.3	34	7	21%	79	
05NS010	12201004	1980	Clearcut	21	8.5	249	68	27%	79	
05NS012	12203001	1981	Seedtree Cut	7	9.2	25	5	20%	79	
05NS008	12301011	1984	Clearcut	7	10.9	99	32	32%	12A	790
05NS009	12403019	1984	Clearcut	14	13.8	135	45	33%	59	79
05NS005	12202110	1988	Clearcut	7	26.3	33	7	21%	59B	
05NS003	12201303	1989	Clearcut	21	40.4	167	65	39%	101	
05NS004	12201307	1989	Clearcut	14	17.8	15	6	40%	56A	
05NS006	12201301	1989	Clearcut	21	20.9	226	79	35%	90	
05NS007	12402304	1989	Clearcut	21	27.9	317	69	22%	56	
05NS001	12403009	1994	Liberation Cut	21	16.0	119	19	16%	79	
05NS002	12403010	1984 & 1994	Shelterwood Cut & Liberation Cut	21	24.2	205	65	32%	79	

**Variability Measure Discussion:***Variability Measure:*

The measure of Forest Plan variability for soil productivity is when changes from baseline levels of the soil's chemical and physical properties exceed 20% as determined by lab analysis.

*Assessment:*

Adoption and implementation of BMPs in 1988 was intended to result in improved compliance with Forest Plan direction to insure that management practices do not adversely affect soil productivity. Thus, with the adoption and implementation of BMPs in 1988, management actions were implemented in response to harvest activities exceeding the Forest Plan variability of 20% change in soil properties prior to 1988.

The results of FY05 soil monitoring indicate that the implementation of BMPs in 1988 and 1989 was not immediately effective in achieving results to comply with the Forest Plan variability of 20% change in soil properties. Results of this monitoring indicate that BMPs have become more effective during subsequent years in limiting "detrimental" soil disturbance to comply with the Forest Plan soil measure of variability for 20% change.

The conclusions drawn from FY05 soil monitoring are corroborated by forestry BMP monitoring conducted by the Forestry Division of Montana Department of Natural Resources & Conservation. In a "Comparison of BMP Audit Results – 2006 With All Previous Audits" the percentage of BMPs providing adequate soil and water protection increased from 80% in 1990 to 97% in 2006 (MT DNRC 2006, page 2).

*Actions in response to variability assessment:*

Because BMPs are currently effective in achieving compliance with Forest Plan variability for monitoring element F-3 when implementing management practices, the Forest Plan "Decision Flow Diagram" says to "continue practices; Re-evaluate at next measure period" (Figure IV – 1, page IV / 20). Thus, there is no need to change current management practices relating to Forest Plan monitoring element F-3.

**Recommended Efforts:**

Further soil monitoring should be conducted in 2006, and subsequent years, to validate the effectiveness of BMPs with contemporary implementation of management practices.

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**(F4) Availability of adequate water to maintain management options, water rights.****Forest Plan Requirements:**

Insure availability of adequate water to maintain management options, water rights

*Intent*

Maintain existing water rights and update Water Uses Requirements and Rights File

**Data Sources:**

Project EA's, AMP's AMO accomplishment reports, water uses and rights files are used to monitor availability of adequate water to maintain management options and water rights.

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Review of ongoing adjudications and various projects.

***Monitoring Activity:***

Continued to monitor the last remaining case in Basin 411. Water rights for Snowbank Lake were also investigated.

***Data Analysis Methods:***

Final Master's reports were issued on the outstanding water rights cases associated with the adjudication in Basin 411 (main stem Missouri) except for one. It was discovered that no statement of claim was filed for the water right for Snowbank Lake water diversion and that the Forest has lost its water right for that diversion. A possible water rights transfer or new water right is being investigated for this site. Data was collected in and around Snowbank Lake for use in water rights transfer or new application to store water.

***Monitoring Results:***

The State is currently in a statewide adjudication and all water rights are reviewed as part of each basin's temporary preliminary decree or preliminary decree. Individual projects are reviewed as to whether additional water rights need to be acquired. We are currently working on one acquisition for Snowbank Lake.

**Variability Measure Discussion:*****Variability Measure:***

Variability which would initiate action – Any change which would require acquisition of additional water rights

***Assessment:***

Forest action to acquire water rights for Snowbank Lake is necessary.

***Actions in response to variability assessment:***

Apply for and obtain a water right for Snowbank Lake.

**Recommended Efforts:**

After meeting with DNRC and Montana Department of Fish Wildlife and Parks it is recommended that we apply for a new storage right for Snowbank Lake and seek another water right to divert water and transfer that right to Snowbank Lake.

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**(G) Minerals****(G1) Forest Service Land Uses That May Affect Minerals Activities****Forest Plan requirements:**

Forest Service Land Uses that may have an effect on minerals activities: minerals activities that may have an effect on surface resources

***Intent***

Check that recommended stipulations are adequate to protect resources but not severely restrictive. Conversely, to check that resources are not severely restrictive on mineral activities.

**Data Sources:**

Data sources include minerals NEPA documents, project files and project field inspections on three ranger districts. Ten reviews are to be completed annually.

## Current Efforts and Findings:

### *Documentation of monitoring methodology:*

Monitoring protocols include project review by Forest Geologist of 5-10 projects with District Minerals Administrators annually through informal discussions during various stages of project NEPA and permitting. Emails and project file meeting notes between the minerals administrator and the ranger, miner or Forest geologist are generally the documentation that is used.

### *Monitoring Activity:*

Monitoring activity includes discussions by Forest Geologist with mineral administrator and district rangers, as well as individual operators.

### *Hard Rock Mineral Activities*

This monitoring item was developed during a period of high mineral activity, particularly exploration drilling for low grade gold deposits. The State of Montana passed a law prohibiting cyanide in new heap leach gold operations. Since 2000 there has been only one exploration drilling project for a low grade gold deposit at Miller Mountain in the Big Belts. That project was completed and most of the bond released in the Fall of 2005. The project owner ceased activities and reclaimed his drill sites and roads due to a lack of a potential buyer. There were no new proposals in 2006.

Small scale placer prospecting activities account for the bulk of the hard rock minerals projects on the forest during the period 2005-6. The forest administers between 50-75 of these projects per year with 6-10 new projects annually as well a similar number that are reclaimed and closed. These projects have been approved with Categorical Exclusions and are generally as such a small scale (less than ½ acre per project on average) that other FS land uses do not affect the project permitting and scope. The consistency in applications and projects suggests that stipulations are not severely restrictive, however, regulatory changes that lead to larger bond amounts are not usually well received by the miners and can result in the scaling back or redesign of a project proposal. Regulatory changes related to Bull Trout listing in drainages west of the Continental Divide have increased project mitigations and Plan of Operations processing timelines for small scale placer projects. Some miners have found these mitigations to be severely restrictive, particularly with respect to available periods for operations.

A small handful of underground lode operations remain active at low levels, including the Bigler mine and White Hope mine.

### *Leasable Mineral Activities*

The Helena Forest completed its Forest-wide Leasing EIS in 1998 and the Record of Decision was upheld in 1999. Since that time, the Helena Forest has leased 76, 579 acres. Most of the lease requests were in 1999. All lease requests have been processed, however, not all of the acres submitted to BLM for sale have been purchased. A seismic proposal was received and processed in 2002 but the project was not conducted.

In 1986, the Helena Forest had 287, 514 acres leased. In 1996, the Helena Forest had 0 acres leased. The Helena Forest is expected to receive additional lease applications in the future and is also expecting to be able to review and submit them to BLM in a timely fashion.

In the winter of 2005, a deep exploration well was initiated near Flesher Pass seeking natural gas in Mississippian carbonates underlying the Lewis Overthrust. This wildcat well was drilled from private land to private minerals that is surrounded by federal land. While the drilling was ongoing, the company submitted a second APD to the BLM for the same site with the intent of drilling to federal minerals. That

proposal was dropped in July 2005 as the initial well was unsuccessful. A review of the stipulations attached to the NFS surface did not appear to negatively impact the company's plans, nor was it identified as the reason for canceling the APD for the second well.

#### Mineral Materials

Nearly all of the mineral materials activities on the Helena Forest are either free – use permits or in-service road material pits. Free use permit requests have increased from about 6-8 per year before 2000 to about 15-20 per year. The increase appears to be related to residential housing growth in the Helena area. Residential project builders are usually seeking material quantities of about 1 ton or less each. The Forest may soon need to look at developing common use areas and charging small fees for material extraction in order to prevent undue small disturbances across the forest.

#### Geologic Resources

Identification and interpretation of unique geologic resources appears to be an area of increasing public interest. The Helena Forest has unique cave resources, overthrust geology, hard rock minerals, post fire debris flows, high elevation wet meadows, a historic hard rock millsite, fossils and semiprecious minerals. The future of study and interpretation of these sites is their interrelatedness to other resources such as wildlife, vegetation and watersheds, as well as cultural history.

#### Abandoned Mines

The Helena Forest has nearly 150 identified abandoned or inactive hard rock mine sites. Documented impacts from some of these sites includes water quality impairment, loss of vegetation growth, and metals bearing sediments that are harmful to human health and aquatics. Since 1995, the Forest has reclaimed 21 sites ranging from <0.1 acre to over 10 acres in an effort to reduce metals contamination to headwaters streams. The Forest currently has 2 mine waste repositories on NFS lands to maintain and monitor and is a cooperator at the Luttrell Regional Repository which has wastes from over 10 Forest Service mine sites and numerous EPA lead mine sites in it. Mine wastes from the Little Blackfoot watershed were disposed in the Luttrell Pit in 2006.

The Mike Horse dam, located in the Upper Blackfoot watershed on NFS lands was evaluated for stability in 2005. The dam was found to be in a deteriorating condition. The Forest is working within the CERCLA framework and responsible parties to resolve the long term issue of this dam. A draft EE/CA was prepared and released for public and agency comment in the fall of 2006. A cleanup option decision is expected in 2007.

Two placer mining highwalls in the Magpie Creek drainage were reclaimed in 2005-6 with grant funds acquired in cooperation with the Broadwater County Conservation District. Along with reshaping of these highwalls, five collapsed placer mining shafts were backfilled along the Magpie Creek valley bottom due to public safety concerns.

#### ***Data Analysis Methods:***

Review CE's and project file documentation. Discuss projects with mineral administrators.

#### ***Monitoring Results:***

The consistency in new applications and projects suggests that stipulations are not severely restrictive; however, regulatory changes that lead to larger bond amounts are not usually well received by the miners and can result in the scaling back or redesign of a project proposal. Regulatory changes related to Bull Trout listing in drainages west of the Continental Divide have increased project mitigations and Plan of Operations processing timelines for small scale placer projects. Some miners have found these mitigations to be severely restrictive, particularly with respect to available periods for operations.

**Variability Measure Discussion:***Variability Measure:*

- #1 - Departure from approved operating plan or violation of assigned stipulations.
- #2 - Unacceptable review of lease application by ID Team
- #3 - Unacceptable restrictions on mineral development

*Assessment:*

- Variability item #1 – a small percentage of hard rock mineral projects invariably result in a departure by the miner from what was approved and bonded. Usually this is a result of miscommunication or lack of cooperation on the part of the miner. The resulting resources impacts, overall, are minor as these projects are localized in nature and relatively infrequent.
- Variability item #2 – does not apply as the Forest completed its leasing analysis and ROD in 1998 which resulted in identification Forest wide of areas available to lease and areas unavailable to lease.
- Variability item #3 – no mineral activities have been eliminated as a result of forest service restrictions. Other factors, such as a Montana statewide ban on new cyanide projects, and global metal markets are more influential to mineral development, than resources restrictions. Travel plans and the resulting closures of roads have the potential to negatively impact initial exploration activities in areas of mineral interest and closed roads.

*Actions in response to variability assessment:*

Travel plans need to specifically identify mineral resources exploration and development activities as a viable use of closed roads and areas, as part of approved Plans of Operation.

**Recommended Efforts:**

Describe any recommendations to accomplish the actions needed, or if no action is needed, to continue the current level of compliance with the monitoring element.

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**(P) Protection**

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**(P1) Acres and volumes in insects and disease infestations****Forest Plan Requirements:**

Monitor acres and volumes of insect and disease infestations.

*Intent*

Assure harvest emphasizes removal of high risk trees for mountain pine beetle attack, and to keep an inventory of acres of high risk stands for insect and disease infestations.

**Data Sources:**

NEPA documentation, R1 Forest Health Protection trip reports and Aerial Detection Surveys, silvicultural prescriptions, survival and silvicultural exams, ground surveys, past sale reviews, and FACTS database.

The Forest Plan lists TSMRS as a data source. This database has been replaced with National FACTS database, which is the appropriate data source to use for this element.

## Current Efforts and Findings:

### *Documentation of monitoring methodology:*

Review and summarization of data from all available data sources described above.

### *Monitoring Activity:*

Areas at high risk of insect and disease infestations are monitored and evaluated for harvest opportunity. Data sources include, silvicultural prescriptions, survival and silvicultural exams, ground surveys, past sale reviews, FACTS, and review of annual FHP aerial detection surveys.

### *Data Analysis Methods:*

Trends of increasing insect and disease activity across the Forest have continued during this monitoring period and can be expected to continue. As a result, most treatments either proposed or implemented contain a strong focus on salvage of dead and dying trees as well as increasing resiliency of residual stands to insects and disease. All project prescriptions also include designs or mitigations to prevent the introduction or spread of insects or disease; these measures include proper slash treatment and removal of infested individuals.

In 2005, volume targeting mountain pine beetle was sold in Greyson Bugs.

### *Monitoring Results:*

Most insects and diseases continued to increase across the Forest in 2005. The exception is Douglas-fir beetle, which was on the rise during the first part of the period but as of 2005 is on the decline. According to reports based on the 2005 annual aerial detection survey produced by Forest Health Protection (Bark Beetle Conditions 2005, project file), across the Forest Douglas-fir beetle infestations were present on 5,600 acres, down from 10,800 in 2004. In localized areas, however, risk to Douglas-fir beetle remains high and new outbreaks are occurring especially following western spruce budworm defoliation and fire activity. Mountain pine beetle, however, increased from 19,400 acres to 24,800 acres in 2005. The bulk of this infestation was in lodgepole pine, but ponderosa pine and whitebark pine are affected as well. Western spruce budworm defoliation also increased to approximately 19,000 acres, which could in turn increase Douglas-fir beetle activity in the future. This insect has caused notable mortality in the Flesher Pass area in particular. The most prominent disease on the Forest continues to be white pine blister rust, which is continues to cause significant mortality in whitebark pine and is often present coincident with mountain pine beetle.

Several NEPA documents were written during this period that focused on areas at high risk to infestation; also, some projects implemented during this time were focused on insects. In 2005, the planning process was begun and/or completed for the following projects responding at least in part to current and potential infestations: Snow Talon Salvage (EIS), Cabin Gulch (EIS), Hay Peggy (EIS), Elliston Face Fuels (CE), and Greyson Bugs Salvage (CE).

Silvicultural review in 2005 confirmed that Douglas-fir beetle activity was continuing in the Snow Talon timber sale; additional timber was marked for removal as a result.

## Variability Measure Discussion:

### *Variability Measure:*

ID team reviews result in an unacceptable review **or** if less than 70% of timber volume is programmed from high risk to mountain pine beetle stands. Introduction or spread of insect or disease.

***Assessment:***

The Forest continues to consider all opportunities to manage stands with current insect infestations as well as those areas at high risk to mountain pine beetle. Specifically, mountain pine beetle outbreaks have been targeted in the Greyson salvage sale and in planning for the Elliston Face Fuels reduction project and Cabin Gulch EIS. No negative IDT reviews have occurred in any treatments with respect to insects and disease.

(However,) The Forest is very proactive in monitoring insect and disease activity, and by considering opportunities to treat for mountain pine beetle in conjunction with all projects is meeting the intent of the standard. The deviation from this standard during this monitoring period is due to the large scale wildfires and subsequent salvage harvest activities.

Insect and disease activity across the Forest is extensive, but is not a result of management actions. Management activity is responsive to natural conditions such as prolonged drought and large scale disturbances such as fire. Proactive control measures have been implemented including the application of anti aggregative pheromones and participation in a regional selective breeding program to develop whitebark pine seedlings resistant to white pine blister rust.

***Actions in response to variability assessment:***

Within stated variability, no additional action is needed.

**Recommended Efforts:**

Continue with a proactive and aggressive forest health effort. Continue to look for opportunities to treat areas at high risk to mountain pine beetle.

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**(P2) Air quality****Forest Plan Requirements:**

Annually monitor air quality

***Intent***

Assure prescribed fire meets state and Federal air quality standards.

**Data Sources:**

The State DEQ also operates Particulate Matter (PM) samplers in Helena and Great Falls

**Current Efforts and Findings:**

Prescribed burning is done when conditions are favorable for minimizing smoke impacts. This occurs either through reducing total emissions produced and/or burning during meteorological conditions that disperse smoke. Burning is conducted according to a prescribed burning plan prepared specifically for each burn. The prescriptions address burning conditions and smoke dispersal.

During spring and summer, this translates into finding the optimum combination of fuel moistures, fuel arrangements and meteorology to minimize downwind impacts. During the fall (September - November) this also means burning according to the restrictions and advice of the Monitoring Unit of the Montana/North Idaho State Airshed Group that currently monitors our burning program.

The purpose of the Monitoring Unit is to regulate fall prescribed burning by members of the Montana/North Idaho State Airshed Group, monitor on-going prescribed burning to ascertain and encourage compliance, and to record and document information pertinent to prescribed burning that leads to improved future operations and better understanding of smoke accumulation problems and cures.

*Documentation of monitoring methodology:*

The program coordinator of the Monitoring Unit works with the National Weather Service to review programs and establish starting dates for ventilation analyses and dispersion forecasts by NWS fire-weather forecasters. The Monitoring Unit considers existing air quality conditions and other local data in each airshed in determining the need for burning restrictions. The expected amount of residual smoke from previous days' burning is evaluated along with meteorological information, NWS forecasts and associated data and PIBAL balloon run data. The State DEQ also operates Particulate Matter (PM) samplers in Helena and Great Falls. This data is used to help determine the need for restrictions.

*Monitoring Activity:*

The State DEQ also operates Particulate Matter (PM) samplers in Helena and Great Falls.

*Data Analysis Methods:*

N/A

*Monitoring Results:*

No violations notices were received to indicate that standards had been exceeded. This information is summarized annually by state DEQ. Measurements are in compliance as determined by DEQ.

**Variability Measure Discussion:**

Variation of +/- 10% beyond standards and guides will initiate action

*Variability Measure:*

+/- 10% beyond standards and guides.

*Assessment:*

Variability is within acceptable limits.

*Actions in response to variability assessment:*

No change necessary.

**Recommended Efforts:**

Continue current management direction.

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**(P3) Fuel treatment outputs**

**Forest Plan Requirements:**

Monitor fuel treatment outputs.

*Intent*

Assure balanced fuel treatment reports.

**Data Sources:**

National Fire Plan Operating Reporting System (NFPORS)

**Current Efforts and Findings:**

Fuel treatment outputs have in the past been tied closely to timber harvest fuel treatments. Fuel treatment methods continue to change over time and acres treated within harvest areas have declined. Congress is currently funding natural fuels treatment (treatments not associated with timber harvest) at a higher level than has been set in the past.

***Documentation of monitoring methodology:***

The National Fire Plan Operating Reporting System (NFPORS) is currently used to track fuels accomplishment acres. Data gathered from previous monitoring reports was used to determine trends.

***Monitoring Activity:***

National Fire Plan Operating Reporting System (NFPORS) report for fuels accomplishments in FY05.

***Data Analysis Methods:***

N/A

***Monitoring Results:***

A total of 5,649 acres of natural fuels were treated in FY05.

**Variability Measure Discussion:*****Variability Measure***

+/- 25% of programmed targets

***Assessment:***

Variability is within acceptable limits.

Would you state the target and compare the accomplishment so we have a number here?

***Actions in response to variability assessment:***

No change is necessary.

**Recommended Efforts:**

Shift emphasis of monitoring to natural fuel treatment areas. For clarification due to reorganization, the Forest Fire Management Officer should be identified as responsible for monitoring and reporting findings.

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**(P4) Wildfire acres****Forest Plan Requirements:**

Wildfire acres burned are to be monitored annually and reported every 5 years.

***Intent***

Assume wildfire acres are within projected annual burned acres and determine the adequacy of the fire management organization.

**Data Sources:**

FIRESTAT database. (from Form R1-5100-29 Reports).

**Current Efforts and Findings:**

The Forest Plan objective for management of wildfire is to limit the area burned to an annual average of 390 acres or less.

***Documentation of monitoring methodology:***

The 5100-29 Reports compile the individual fire information and are stored in the FIRESTAT database. These are transmitted and reported annually.

***Monitoring Activity:***

FIRESTAT reports were reviewed to determine acres burned and financial management reports were reviewed to determine costs.

***Data Analysis Methods:***

Summarization of records.

***Monitoring Results:***

The current five year average is approximately 8,443 acres burned. See Chart below.

**Variability Measure Discussion:**

Variation of +/- 25% above projected average of annual wildfire burned acres will initiate action.

***Variability Measure:***

Variation of +/- 25% above projected average of annual wildfire burned acres.

***Assessment:***

The variability on average is within acceptable limits if you do not count the large fire year of 2003 being above the 25% projected average of wildfire burned acres, if the large fire year of 2003 is considered the variability is outside of the acceptable range.

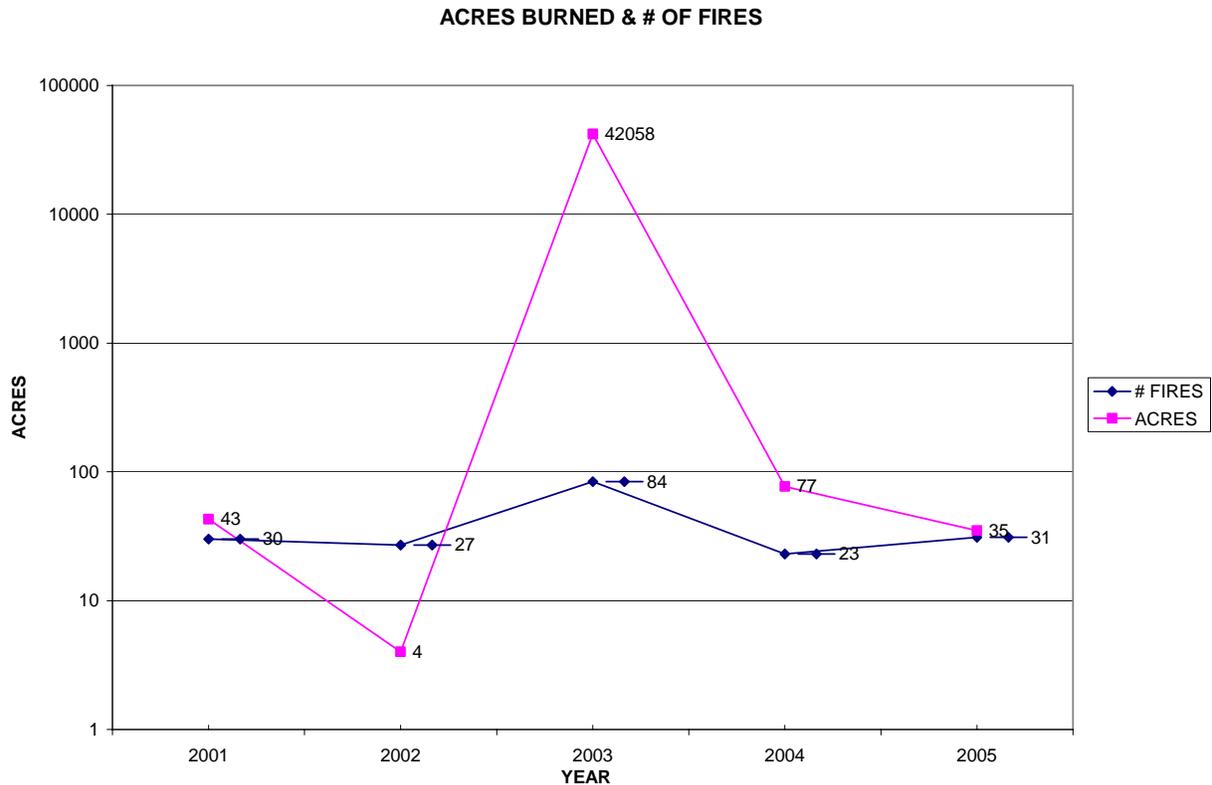
***Actions in response to variability assessment:***

No change to monitoring element is necessary at this time. Large fires are heavily dependant on weather and drought patterns, large fires will continue to occur during periods of extended dry weather.

**Recommended Efforts:**

Continue current management direction which periodically re-evaluates fire staffing needs.

Review acre objective at Forest Plan Revision. For clarification due to reorganization, the Forest Fire Management Officer should be identified as responsible for monitoring and reporting findings.




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## (P5) Cost of suppression, protection, organization, and net value change

### Forest Plan Requirements:

Monitor annually the cost of suppression, protection, organization, and net value change Report every 5 years.

#### *Intent*

Keep fire management program cost effective.

### Data Sources:

Financial reports.

### Current Efforts and Findings:

As noted in the previous element, wildfire acres have far exceeded Forest Plan projections and suppression costs have been dramatically higher as well. The National Fire Plan in conjunction with 30-mile mitigation requirements are associated with some of the increases for both WFPR and WFSU costs.

#### *Documentation of monitoring methodology:*

Financial reports were compiled showing the costs of suppression and final budget figures were reviewed for the total preparedness budget information.

***Monitoring Activity:***

The NFMAS process has been used for budget submissions for the HNF Fire Program. Costs for WFSU were derived from Transaction Register Summaries pulled by B& F. WFPR total allocations were derived from B&F final PBA data. Net Value Change is no longer tracked through fire management programs.

***Data Analysis Methods:***

Summarization of records.

***Monitoring Results:***

In 2005 the Forest spent \$ 404,671 in the suppression of wildfires. The 5 year average is \$ 5,015,159 which includes the large fire cost year 2003. See Chart I.

**Variability Measure Discussion:**

Variation of +/- 5% increase in real costs will initiate action.

***Assessment:***

The Forest has increased its dedicated firefighting workforce considerably since the mid-80's. Congress is now funding wildfire suppression at higher levels than in past.

***Variability Measure:***

+/- 5% increase in real costs.

***Actions in response to variability assessment:***

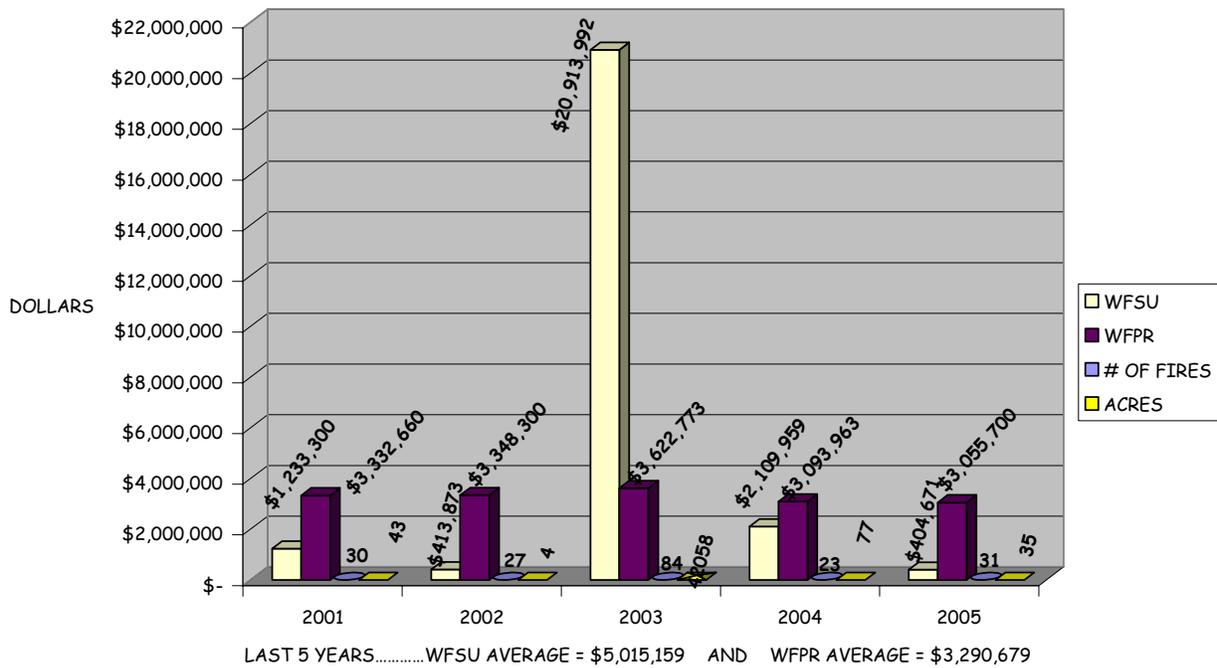
Variability stated cannot be met annually as the true cost of suppression, protection and organization is beyond the control of the forest as an individual unit.

**Recommended Efforts:**

Continue current management direction which periodically re-evaluates fire staffing needs.

For clarification due to reorganization, the Forest Fire Management Officer should be responsible for monitoring and reporting findings.

P5 COSTS DATA FOR FY05 MONITORING REPORT  
(WFPR costs include cost pools, OWCP, etc)



## (L) Facilities

### (L1) Roads

#### Forest Plan Requirements:

Local roads in place and collector roads constructed

*Intent:*

Insure that assumptions are valid concerning: 1. Local/collector road density 2. Local/collector road standards

#### Data Sources:

INFRA Travel Routes inventory, road accomplishment reports, EA's, transportation plans, and final construction reports. The TIS inventory has been replaced by INFRA (I-Web).

#### Current Efforts and Findings:

Currently, no new roads are being constructed without prior Roads Analysis and NEPA decisions.

*Documentation of monitoring methodology:*

New Road Construction is required to meet requirements of Forest Service Manual and Best Management Practices (BMPs).

**Monitoring Activity:**

Any new road construction would follow the requirements of the Forest Plan and NEPA.

**Data Analysis Methods:**

Methods to analyze newly constructed roads would be by a Final Inspection Report which would be filed in the Project folder and then entered into INFRA.

This newly constructed road would also continue to be monitored as per L2 requirements.

**Monitoring Results:**

Resource Element L1 monitors the miles of local roads in place and the miles of collector roads constructed on an annual basis. The Forest Plan stated that there were 1607 miles of system roads on the HNF in 1980 (the base year for the Forest Plan) and predicted that 22 miles of road (9 miles of collectors and 13 miles of locals) would be built each year. This would increase the total system miles to 2520 after five decades (or about year 2035). The attached table shows the miles of road in the system (now called the Transportation Atlas) by year since 1986. The table also shows the miles of road constructed each year. Where there are blanks in the table there is no information available. For two years, 2001 and 2002 the data is incorrect. There was an error in the database that caused many roads to be double counted. Data for those two years should not be considered.

**Helena National Forest Road Information**

Year	Miles in System	Miles Closed Yearlong	Miles of Collector Constructed	Miles of Local Road Constructed	Forest Plan Projections, Miles	Forest Plan Projected Collectors & Locals, Miles to be Constructed Each Year
1986	1607	207	6	15.2		
1987			6.5	16		
1988			4.8	12		
1989			3.2	8.1		
1990			2.6	6.5		
1991			2.2	5.3		
1992	1680	325	3.3	8.2	1761	+22
1993	1680	325	1	3	1783	+22
1994	1940	568	0.5	0.9	1805	+22
1995	1990	570			1827	+22
1996	1887				1849	+22
1997	1776	335	0	0	1871	+22
1998	1899	339	0	0	1893	+22
1999	1837	334	0	2	1915	+22
2000	1954	297	0	0	1937	+22
2001	(1)	(1)	0	0	1959	+22
2002	(1)	(1)	0	0	1981	+22
2003	2847	888	0	0	2003	+22

Year	Miles in System	Miles Closed Yearlong	Miles of Collector Constructed	Miles of Local Road Constructed	Forest Plan Projections, Miles	Forest Plan Projected Collectors & Locals, Miles to be Constructed Each Year
2004	2832	888	0	0	2025	+22
2005 (2)	2829	888	0	0.3 (3)	2047	+22

(1) For two years, 2001 and 2002 the data is incorrect. There was an error in the database that caused many roads to be double counted. Data for those two years should not be considered.

(2) This number varies slightly from the 2004 number due to actual on the ground surveys and therefore the adjustment of the mileage.

(3) The 0.3 miles of road constructed was at MacDonald Pass to access a trailhead.

The Forest Plan assumed the total system miles should have been 1761 in 1992, 1871 in 1997, and 2,025 in 2004. The actual numbers were 1680 in 1992 (a 5% variance from the predicted), 1776 in 1997 (a 5% variance) and 2832 in 2004 (a 40% variance). The total miles in the system stayed within the plus or minus 20% tolerance until 2003. The reason for exceeding the variance in 2003 and 2004 is that the definition of a road in the Forest Plan differs from the definition used today as a result of the National Forest Service policy change with the new National Roads Policy adopted in 2001. The Forest Plan assumed that the 1607 miles of road inventoried in 1980 comprised all of the roads on National Forest land that were being used by vehicles. Low standard, low traffic "Jeep trails"/ roads, were not considered part of the system at that time. As per the 2001 Road Policy, all vehicle travel-ways including these low standard routes are considered system roads. Over the years many of these routes were added to the system, while others were decommissioned (obliterated). Partially to implement the new National Road Policy and partially to prepare for forest-wide travel planning, the Forest began an effort in 2001 to inventory all of the existing roads on the Forest. In 2001 and 2002 the roads database incorrectly double counted many of these new roads that were added to the system. That is why the values for those years are incorrect.

In 2005 an adjustment was made to the mileage due to on the ground condition surveys. Not all roads are surveyed every year and so adjustments will probably continue as other roads are surveyed.

The Forest Plan predicted that the Forest would build 9 miles of new collector roads and 13 miles of local roads each year between 1986 and 2035. The table above shows that since the plan as been adopted there hasn't been a year when that many miles of road were built. In 1986 and 1987 the total miles of road constructed came close to that prediction (well within the variance of 20%), but beginning in 1988 the miles of road construction was outside the 20% variance from the predicted 22 miles per year. The annual miles of road construction fell sharply in the early 1990's and, since 1995, very few new roads have been constructed on the Forest. The predicted miles of new road construction assumed the Forest would be building roads in inventoried roadless areas to access timber stands. After the mid-1990's no roads have been built in inventoried roadless areas due to changes in national policy and public support. Road construction outside inventoried roadless areas has almost completely stopped, with timber harvest using existing roads, temporary roads or logging systems (helicopter) that don't require closely spaced roads.

#### Variability Measure Discussion:

##### *Variability Measure:*

Variation of +/- 20% of predicted miles of road will initiate action.

***Assessment:***

Under the Forest definition of a road, the actual number of miles is under the projected amount under the Forest Plan definition. However, under the 2001 Road Policy definition, the Forest is well within the variability limits.

***Actions in response to variability assessment:***

No action is needed since the Forest is within the variability as defined by the 2001 Road Policy.

**Recommended Efforts:**

With the virtual elimination of road construction to support the timber program, measuring the miles of collector road constructed is no longer a meaningful monitoring element. The total miles in the system is a valid element and one that is done annually when the forest prepares the Road Accomplishment Report (RAR). The RAR also annually tracks the miles of road by maintenance level, miles reconstructed, miles receiving maintenance, and miles decommissioned. All of these are valid monitoring elements and should be included in the revised Forest Plan. In addition to the items covered by the RAR another new monitoring element that should be considered during Forest Plan revision would be the miles of road open to dual use.

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**(L2) Road Management****Forest Plan Requirements:**

Monitor Road management

***Intent***

Insure that assumptions are valid concerning:

- Collector roads.
  - a. yearlong closures
  - b. seasonal closures
- Local roads
  - a. yearlong closures
  - b. seasonal closures

**Data Sources:**

INFRA Data base.

Actual road condition surveys to record lengths, condition and needed improvements.

Travel Routes Inventory maintenance plans and travel plans are used to insure that assumptions are valid concerning yearlong closures, and seasonal closures of collector and local roads. TIS data base has been replaced by INFRA data base. Travel Management plans are subjected to the NEPA process.

**Current Efforts and Findings:*****Documentation of monitoring methodology:***

Random sampling on forest roads is occurring yearly for required Annual and Deferred Maintenance needs, and the INFRA data base is updated.

***Monitoring Activity:***

Qualified road/engineering personnel perform monitoring activity. This is a process in which personnel go out to the field and to the randomly selected specified road. A complete road condition survey is completed. This is usually when road lengths, maintenance levels, and closure restrictions are reviewed.

***Data Analysis Methods:***

Analysis of the data is checked against approved Travel Plans on record.

***Monitoring Results:***

Resource Element L2 monitors the miles of road closed to vehicle use either seasonally or year long. The variability that would cause action is plus or minus 30% of the predicted road miles. The Forest Plan stated that of the 1607 miles of road in the system 207 were closed either year long or seasonally. The plan predicted that the miles closed would increase to 327 by the end of the first decade and to 870 miles by the end of the fifth decade. There is no way to measure the miles of road closed seasonally on an annual basis, however the miles with year round closures by year since 1992 is known. In 1997, at the end of the first decade of the Forest Plan, there were 335 miles closed year long. This is only a 2% variance from the predicted number of closures. In 2004 there were 888 miles closed year long, which is close to what the plan predicted would be closed by 2035.

Of the total system miles of road in 2004, 2,832 miles, 1,155 miles are open yearlong. This means there are 1,677 miles with either yearlong or seasonal closures. As noted above there are 888 miles closed yearlong, leaving 789 miles with seasonal closures. The Forest Plan predicted that there would be about 1530 miles of road open yearlong by 2004. The decrease in miles open yearlong has come about as a mitigation measure for many projects taken on over the last twenty years. In most of the timber sales since 1986 wildlife mitigation has called for closing some existing roads in the area either seasonally or yearlong.

The miles of year long closures are somewhat close to the miles for both seasonal and year long closures predicted by the plan, and the seasonal closures have generally exceeded the miles closed each year since 1986. These additional miles of closures have come through travel plan decisions that either were attached to a timber sale or were stand alone decisions. Since the Forest Plan was written there has been an unanticipated surge in motorized recreation on the Helena NF. To control that increased use, seasonal or year long closures have been placed on more roads than had been predicted.

From year 2000 data to the 2003 data (since 2001 and 2002 is unusable due to errors) 893 miles were added to the recorded data that was not recorded in previous years due to implementation of the National Roads Policy in 2001. Prior thought to why these roads were not counted could have been due to assuming these roads were not generally passable by a standard vehicle. They were rough unusable 4 wheel drive "Jeep" roads, and not considered to be used much, if at all. The National Roads Policy changed that and they were added to the Forest Inventory. Once these roads were accounted for, many roads were decommissioned and/or obliterated, thus the changed number in miles of roads closed year long, as well as the increase of miles in the system.

<b>Year</b>	<b>Forest Plan Assumption, miles</b>	<b>Actual</b>
2000	1937	1954
Correction	+893	+893
2003	2830 (under 2001 definition)	2847

The Forest Plan assumed in year 2000 that there would be 1,937 miles of road in the system and the Actual number of miles was 1,954 miles and 297 miles closed yearlong. Once a correction was made to add the miles of previous, unaccounted for miles of road, the actual miles of road in the system in 2003 was 2,847 miles; an increase of 893 miles. Had that been added to the Forest Plan projection, that would have kept the forest within a 1% variance between the two scenarios.

Also worth noting, is the difference in Roads Closed yearlong, which changed from 297 miles in year 2000 to 888 miles in 2003. Year 2000 shows that 15% of the roads were closed year long while 2003 shows 31% of the roads closed year long, 31% in year 2005.

The reason the number and percentage amount has risen so drastically on miles of roads closed, is due to the 2001 Roads Policy correction and closure of these "Jeep Trails".

#### Variability Measure Discussion:

##### *Variability Measure:*

Variation of +/- 30% of miles of predicted roads closed either seasonally or yearlong will initiate action

##### *Assessment:*

Assuming the miles of road open yearlong in 2005 cumulatively represents the situation in the years between 1986 and 2005, we are very close to the variability limits and no action is needed, as further variations will continue to fluctuate as Road Condition surveys continue into the future

##### *Actions in response to variability assessment:*

As other travel management plans are created, monitoring in reference to the Forest Plan and NEPA decisions will be required.

#### Recommended Efforts:

No Action is needed to continue the current level of compliance with this monitoring element.

The Road Accomplishment Report (RAR) annually tracks the miles of road by maintenance level, miles reconstructed, miles receiving maintenance, and miles decommissioned. All of these are valid monitoring elements and should be included in the revised Forest Plan. In addition to the items covered by the RAR another new monitoring element that should be considered during Forest Plan revision would be the miles of road open to dual use.

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## Heritage Resources

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### Heritage Monitoring

#### Forest Plan Requirements:

The Forest Plan does not identify any monitoring requirements for heritage resources. Monitoring is completed annually to comply with the Archaeological Resources Protection Act of 1979 (as amended) and related federal historic preservation legislation.

#### Monitoring Methodology:

The HNF maintains an inventory of all sites located on the forest. Each site possesses a corresponding site form that contains data about the site including location (plotted on a U.S.G.S. topographic map), setting, site description, size, and site condition. Site forms are used to relocate heritage sites for

monitoring purposes. When sites are monitored they are visited in the field and photographed and information observed is compared with information noted when the site was originally recorded. Monitoring forms are completed during site field visits that detail the condition of the site and a description of what currently exists on site. These forms are kept in the site form folder. Ultimately, all site monitoring data will be entered into INFRA.

### Current Efforts and Findings:

Over 1000 heritage sites are currently identified on the HNF as a result of project and non-project surveys completed since 1978. Annual resource monitoring in 2005 focused primarily on those heritage sites listed in or eligible for the National Register of Historic Places. In 2005, livestock grazing atop archaeological sites around natural springs, and in and around old historic homesteading, mining and ranching sites was the most frequently identified impact to heritage resources. The effect of livestock grazing atop the Lewis and Clark National Historic Trail and related sites in the Alice Creek Basin and atop Lewis and Clark Pass was noted.

In 2005, HNF archaeologists evaluated the condition and integrity of 30 known archaeological and historical sites as part of compliance inventories or separate stewardship projects. These monitoring activities and projects are reported in the forest's annual heritage resource compliance report to the Montana State Historic Preservation Office (SHPO) and the Confederated Salish-Kootenai and Blackfeet Tribal Historic Preservation Offices (THPO).

Monitoring was completed for five forest projects to determine whether recommended heritage mitigation measures had been devised and/or implemented as prescribed in compliance inventory reports and/or NEPA documentation. This monitoring was primarily focused on range, minerals and prescribed burn projects.

Six archaeological sites located along the Lewis and Clark National Historic Trail across the Helena NF were monitored in 2005. The condition of the prehistoric-historic trail tread was also inspected.

Monitoring was conducted at the Hellgate Pictograph site and photos were taken of the 18 panels present at the site. The photos were compared with to-scale recordings collected of the panels in 1999. Graffiti removal of modern markings was conducted in 2000 and no further graffiti has been added to the pictograph site since that time

Data recovery work was undertaken at four sites located on the HNF. Included in 2005, were sites 24LC1064, 24ME631, 24ME633, and 24ME634. Site 24LC1064, located along the Missouri River, had seriously deteriorated with much of the site being washed away by wave action. Data recovery efforts were initiated to preserve and collect the remaining contents of the site. In 2005, Aaberg Cultural Resource Consulting Service completed data recovery at three open-air prehistoric occupations (24ME631, 24ME633, 24ME634) in the Dry Range to facilitate a land exchange between the Burnett Ranches, Inc. (6666 Ranch) and the HNF. The adverse effect of this land exchange (transfer of National Register-significant properties from public ownership) was mitigated through scientific data recovery.

Based on the results of a multi-year monitoring program, in 2004 the HNF and Pennsylvania Power and Light-Montana (PPL) completed an erosion control project at archaeological site, 24LC237 in upper Holter Reservoir. The effectiveness of this newly installed erosion control system was part of annual resource monitoring plan in 2005 by HNF and PPL archaeologists. Erosion control efforts at this site appear to have been successful as the banks are stabilized and no further erosion was noted.

The historic Evening Star Mine had 1,124 cubic yards of toxic mill tailings removed from the site. Measures implemented during construction to protect historic ruins and equipment included fencing and

the development of designated routes and parking areas for heavy equipment. These measures were put in place prior to project implementation with project construction monitored by HNF heritage personnel. The long-term protection of this significant historic mine complex is an issue due to improved road access, coupled with the absence of a completed travel management plan for the Little Blackfoot drainage that could allow for the permanent closure this access road. The mill was apparently the scene of paintball warfare over several weekends when construction was stopped. In addition, some of the mining refuse and equipment "walked away". These concerns were brought to the attention of HNF law enforcement officers and the buildings are now signed.

#### **Recommended Efforts:**

Monitoring should be included as a component when the HNF Forest Plan is revised. To comply with federal legislation, HNF heritage resource monitoring should continue as an important component of the Forest's annual program of work (POW). A site stewardship (volunteer) program should be developed to extend site-monitoring capability. Site stewardship programs have been very successful in states such as California and Arizona.

Time lags often occur between project development and NEPA analyses, and project implementation. This disjunction has made it difficult to track the status of recommended heritage resource protection and/or mitigation measures during project implementation, which has resulted in inadvertent damage to some heritage resources. Better HNF project tracking--from analysis through implementation--is needed. This would likely benefit all resources.

Some forest projects, such as the extensive abandoned mine reclamation efforts can expose heritage resources to vandalism and artifact theft as a result of increased road access, visibility and other factors. These projects should therefore be carefully monitored during and after construction, and access should be changed or made more challenging to abate and discourage heritage site depredation.

Recurrent impacts to some heritage sites have not been adequately addressed. Although some livestock control measures have been implemented, damage is still occurring to or threatens the Lewis and Clark National Historic Trail and related archaeological sites. The national historic trail will be nominated to the National Register of Historic Places as a National Register district over the upcoming two years. Protection measures for highly significant heritage resources on the HNF need to be fully and effectively implemented, and then monitored.

Site vulnerability assessments to address threats from wildfire, vandalism and other events, and protection/abatement plans, should be developed for highly significant and fragile heritage resource properties on the forest. Historic preservation and site management plans for significant heritage properties, such as the historic Moose Creek Ranger Station and the Evening Star Mine, should be developed and their management guidance followed. Issues of site vandalism, particularly at the Evening Star Mine will also need to be addressed in the near future.

All forest personnel should continue to note resource damage to heritage sites, and promptly involve law enforcement where vandalism, collecting and digging is occurring. Damage assessments should be completed, and restoration measures (i.e. graffiti removal, fencing, signing) implemented, for threatened disturbed or vandalized heritage resources.

The HNF heritage database will be converted to the INFRA data system in the near future to ensure better documentation and systematic tracking of multiyear monitoring work.

The HNF should continue to aggressively pursue heritage resource public outreach and education via *Passport in Time* and other volunteer projects, guided hikes and other educational events, and interpretive signing and other media. These efforts create greater public awareness of the value and importance of conserving heritage resources on the HNF.

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## **(T) Economics, Adjacent Lands, Resources, and Communities**

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### **(T1) Economics**

#### **Forest Plan Requirements:**

Verification of unit cost used in Plan compared to on-the-ground cost.

##### *Intent:*

Acquire accurate cost data.

#### **Data Sources:**

Timber sale appraisal, contracts, allotment, management plans, cost/output for various resource programs, sale area betterment plan, timber sale report.

#### **Current Efforts and Findings:**

##### *Documentation of monitoring methodology:*

Summarization of records.

##### *Monitoring Activity:*

The T-1 monitoring element is on a 5-year reporting interval. The FY01 report included the T-1 information and reporting should again occur in FY06. Information is still compiled for all of the data sources specified for this monitoring requirement. The Forest maintains timber sale appraisals, contracts, sale area betterment plans, and timber sale reports. Various resource program managers also maintain Cost/output information and the individual districts maintain allotment management plans. The Helena National Forest records are available for review by interested parties.

In addition to information provided here, the Forest distributes an annual "Update" to a wide local audience and attaches a copy to each Annual Monitoring Report. The Update specifies a number of costs, receipts, and outputs.

##### *Data Analysis Methods:*

Not applicable.

##### *Monitoring Results:*

No monitoring is provided in 2005.

#### **Variability Measure Discussion:**

##### *Variability Measure*

In general, +/- 25%. However, very large cost items, such as road construction and logging cost, would have a smaller degree of acceptable variability, i.e. 10%

##### *Assessment:*

No assessment of this element will be made in 2005.

*Actions in response to variability assessment:*

No action required at this time.

**Recommended Efforts**

No efforts are recommended at this time.

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**(T2) Adjacent lands, resources, and communities****Forest Plan Requirements:**

The effect of National Forest management on local economies, recreation opportunities, down stream water uses, visual quality, and local air quality is to be monitored. Likewise, effects of management on adjacent lands on National Forest land goals and objectives are to be monitored.

*Intent:*

Determine effects of Forest Plan on other ownership.

**Data Sources:**

Reports from appropriate resource monitoring items. New public issues and management. Reports from appropriate resource monitoring items, review of other Agency plans, new public issues and management concerns.

**Current Efforts and Findings:***Documentation of monitoring methodology:*

Summarization of data sources.

*Monitoring Activity:*

Part of the focus of the Forest Service Chief's Healthy Forest Initiative is on healthy local economies as well as healthy forests. This includes consideration for opportunities to enhance recreation-related businesses as well. The Forest Service maintains a State and Private Forestry division that helps local individuals, organizations, and governments to work cooperatively with this agency. At the local level, project analyses provide discussion of management effects to recreation, water, visual quality, and air quality. As to activities on adjacent lands, the Chief has identified conversion of open timberlands and rangelands to smaller developed parcels as one of the four threats to maintaining present resource values on National Forest system lands. This should help foster discussion of this aspect of long-term management of the Forests. At the local level, we monitor adjacent activities primarily through cumulative effects analyses.

*Data Analysis Methods:*

Summarization of data sources.

*Monitoring Results:*

Numerous cumulative effects have been evaluated in NEPA processes in 2005. No unacceptable impacts to adjacent lands have been identified.

**Variability Measure Discussion:***Variability Measure:*

Unacceptable results of an ID Team review would initiate action.

***Assessment:***

Resource management conflicts and cumulative effects considerations continue to be identified, evaluated, and addressed through biological and social assessments, analysis, management modifications, mitigation measures, or other management actions. At this time no unacceptable impacts have been identified.

***Actions in response to variability assessment:***

Within variability, no action is required.

**Recommended Efforts:**

Continue IDT review of projects.

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**(T3) All Resources, Effects of Emerging Issues or Changing Social Values****Forest Plan Requirements:**

Effects of emerging issues or changing social values

***Intent***

Keep publics informed, through educational and environmental programs, raise FS awareness to public concerns.

**Data Sources:**

NEPA processes public involvement, issue and target group analysis. In addition to Regional appeals/litigation trends and Montana Discovery Foundation, public education programs.

**Current Efforts and Findings:**

Current processes on the Helena NF can be summarized under Community Outreach, SOPA/PALS, Forest NEPA processes, and Regional Appeals. Not intended to be all-inclusive.

**Community Outreach:**

Ongoing community outreach programs such as learning/teaching sessions, presentations, and lectures series. See *'Monitoring Activity'* below for a list of numerous efforts in events and programs that were provided during 2005.

**SOPA/PALS:**

In an effort to improve public service, the Helena NF Planning shop continues to produce a Schedule of Proposed Actions (SOPA) that is required quarterly and is intended to provide notice of upcoming proposals, which may undergo environmental analysis and documentation to interested and affected agencies, organization, and persons. The SOPA is produced through a National database called Planning, Appeals, and Litigation System (PALS). PALS contain coverage nationwide, is a searchable database, and can be used locally as well as nation-wide. This system provides a 24-hour availability for interested publics and organizations a way to get involved in specific Helena NF projects.

**Forest NEPA:**

Once interest is conveyed in a specific project, continued involvement is afforded through the formal NEPA processes through scoping, legal notices, news releases, comment periods, and continued involvement throughout a given project. See the above SOPA list for the extent of NEPA projects that were processes during 2005.

Through the above NEPA processes, the interested publics, organization, other agencies, and tribes all have the opportunity to be involved as much or as little as they desire. This involvement creates opportunity for understanding, education, collaboration, or concurrence for both the interested publics and the agency. These processes foster a direct response to this monitoring item intent in keeping the public informed through educational and environmental programs while raising the Forest Service's awareness to public concern.

Forest Appeals:

If projects are appealed, there is a Region 1 process that reviews these appeals and identifies the appeal points presented by the appellant. In identifying the appeal points end up being an indication of the environmental issues the public holds concern for. These appeal points can be those indicators showing the potential emerging issues of the day and could show trends in our changing social values for our the pleasure and uses of our National forests.

Documentation of monitoring methodology:

Community Outreach:

Ongoing community outreach programs have evolved on the Helena NF. Learning sessions with area students, presentations by experts and discussion panels have occurred, and contacts with community leaders and elected officials continues.

SOPA/PALS:

The Helena NF specialists at the District and Supervisor's Office provides the needed information on a quarterly bases to the PALS coordinator at the Supervisor's Office. It is interred electronically to the National database and becomes available to the general public as well as to the agency and Congress. This information is a tool in assessing accomplishment of agency goals and objectives. There are a number of reports that can be derived through this system such as number of signed decisions at the decision memo, decision notice, or record of decision level. In providing this quarterly update the public can access the web page and see Forest projects that may be of interest to them.

Forest NEPA:

Forest NEPA processes documents all that goes on with a given project from conception through possible litigation. Most all projects have a specific project file that is used as the evidence toward a well-informed decision. In this project file, a public involvement process is on going and is accumulated reflecting public issues and concerns for the proposal.

In the context of these documents, the emerging issues and changing social values can be discerned particularly at the scoping and comment period phase of public involvement. Scoping and comment are more formal processes in a given NEPA project phase. The public input is filed, documented, and agency responses developed (when applicable).

Forest Appeals:

At the Regional Office (RO) in Missoula, a panel of three Forest or grassland employees from across Region 1, complemented with RO appeal specialists, convenes to identify the appeal points presented by the appellant. Once the panel completes its task, it is presented to an appeal review officer to review the findings and affirms or modifies the team's findings. The results are compiled, documented, and presented to an appeal-deciding officer to conclude by affirming or returning the appeal back to the responsible unit of the project.

These finding can be used by the Helena NF to improve future projects by applying these results as well as utilizing this information to support this Forest monitoring item.

***Monitoring Activity:****Community Outreach:*

Documenting events through brochures and newsletters such as "*Community Naturalists*" and counting participation during a given event. Snowschool, Adopt-A-Species, Winter Survival, Winter Ecology, Outdoor Skills, Scats and Tracks, Moonlight hike, Wilderness Education, Weather Activities, Wildflowers, Fall Ecology, Leaves, etc. are but few events that were provided in 2005.

*SOPA/PALS:*

The following information was submitted and is available from the SOPA: Project Name, Type of Project, Location, Type of NEPA Document, Status of Project, Decision Date (actual/estimated), projected Implementation Date, and a Forest Contact.

*Forest NEPA:*

The projects listed in the above mentioned SOPA all have some level of detail in their project files that give some indication of the emerging public issues or changing social values. Specifically, the scoping process and comment period give the best feel for these issues or changes.

In 2005, the bigger ticket item projects include the Lynx amendment, Noxious Weeds Project, North Belts Travel Plan, Snow Talon Salvage, and the MacDonald Pass Biathlon.

*Forest Appeals:*

The appeals on the Helena NF addressed in this monitoring report included the Lincoln Airport Special Use Permit, Snow Talon Fire Salvage Project, and the North Belts Travel Plan

***Data Analysis Methods:****Community Outreach:*

Periodically, the "*Community Naturalists*" are mailed to the interested publics. Sponsored events are tracked on a spreadsheet including date, Organization, Location, # of Participants, and Activity conducted.

*SOPA/PALS:*

The SOPA is updated and provided on a quarterly bases via a web page and hard copy mailings. The general public, the agency, and Congress can request reports from this database. Currently it can be use to track NEPA projects and those that deal with cooperating agencies. In the future, other planning processes, appeal, and litigation will also be able to be tracked.

*Forest NEPA:*

In the big-ticket projects, the interdisciplinary teams (IDT) for each of the projects conducts a level of analysis that evaluates the public input received during for these projects. This process is sometimes referred to as 'content analysis'. The IDT evaluates the public input and, with the concurrence from the responsible official, determines if the comment is within the scope of the project, may be used as the foundation of an additional alternative, can be used to develop mitigated the concern, or used to enhance and improve the resource effects analyses.

*Forest Appeals:*

The above appeals on the Helena NF in 2005, were reviewed and appeal points listed.

***Monitoring Results:****Community Outreach:*

There is continued interest and support for the "*Community Naturalists*". Numerous programs and events were provided through the Montana Discovery Foundation. In 2005, over 4,800 people participated in the Montana Discovery Foundation sponsored events.

*SOPA/PALS:*

There were about 49-63 projects listed in any given quarterly SOPA in 2005 that contained a variety of projects from noxious weed control, mineral extraction/exploration, fuels reduction, watershed improvement, trail reconstruction, range improvement, travel management, vegetation manipulation, to special uses. The projects included environmental analyses of categorical exclusions, environmental assessments and environmental impact statements; resulting or moving toward decision memos, decision notices/FONSIs, or record of decisions. The status of these projects varied from scoping, developing the proposal, conduction analysis, complete, or on hold.

*Forest NEPA:*

In respect to the Lynx project, which is a multi-state, multi-agency effort to amend Forest Plans, including the Helena Plan, is being analyzed to incorporate guidance for lynx recovery. This is an example of an issue that cannot be adequately addressed with current Forest Plan guidance but being addressed at a regional level.

For the local projects listed above, some of the main issues raised were the use of herbicides near riparian areas for Forest noxious weed treatments project, the North Belts Travel Plan that is too restrictive for access to our Forest lands, the Snow Talon Fire Recovery Project is salvaging too many trees reducing wildlife habitat and possibly exasperating potential for soil sedimentation into local streams, and the MacDonald Pass Biathlon could inhibit wildlife movement.

All of these issues or concerns may be pertinent or perceived. That's not the purpose of this monitoring item; the purpose is to become more knowledgeable and aware of the emerging issues and changing public demands and to appropriately address them through educational opportunities, programs, and environmental due processes.

*Forest Appeals:*

The following table display the main projects appealed in 2005 with a summarization of the appeal points. Agency responses are documented in the Appeal Review Officer's letter to the Appeal Deciding Officer (See monitoring project file).

<b>Project Name</b>	<b>Appeal #</b>	<b>Appeal Point (Summarized)</b>
Lincoln Airport Special Use Permit	#05-01-00- 0030	
		Issue 1: Felt their comments were not properly considered prior to the decision.
		Issue 2: Acres committed to project removes lands from the National Forest system without due process
		Issue 3: Decision maker did not consider cumulative effects on old growth habitat within the administrative site of the Blackfoot River drainage.

Project Name	Appeal #	Appeal Point (Summarized)
		Issue 4: Make the permittee responsible for the maintenance of the improvements.
Snow Talon Fire Salvage Project	#05-01-00-0026	
		Issue 1: Forest Service failed to discuss most of the scientific issues that their scoping and DEIS comments raised or available literature.
		Issue 2: Under NFMA, the Helena Forest Plan is inadequate and out-of-date.
		Issue 3: Analysis failed to adequately disclose and assess 'incidental take' and other cumulative impacts on grizzly bear across the Northern Continental Divide Ecosystem.
		Issue 4: Effects on native fish species and habitat would violate NFMA, NEPA and ESA.
		Issue 5: Project violates NFMA relative to old growth, mature conifer forest, and snag habitat & management indicator species.
		Issue 6: The Helena NF has failed to monitor as required by the Forest Plan.
		Issue 7: The Forest need to re-examine the issue of suitability for timber production.
		Issue 8: The analysis for soil productivity is inadequate.
		Issue 9: NFMA & NEPA would be violated in regard to sensitive species.
		Issue 10: Roadless analysis is inadequate.
		Issue 11: Consideration of noxious weeds and herbicides violates NEPA, NFMS, APA, and the Data Quality Act.
		Issue 12: Cumulative effects of past management and monitoring were not adequately considered.
		Issue 13: The habitat analyses are based on scientifically flawed methodology.
		Issue 14: The Forest's analysis and monitoring of economics is inadequate.
		Issue 15 Contention 1: The Helena NF is violating NFMA by allowing the purchaser to determine which trees are expected to live and which snags to be taken. Contention 2: The Helena NF violates law by using an untested model to determine whether fire damaged trees will die.
North Belts Travel Plan	#05-01-00-0031	
		Issue 1: The travel plan fails to recognize the Mineral Leasing Act of 1920 and access needs for development.
		Issue 2: The 300 foot design feature is subject to interpretation.
		Issue 3: The disparity between motorized and non-motorized use is not properly addressed.

Project Name	Appeal #	Appeal Point (Summarized)
		Issue 4: Future management access is not properly analyzed.
		Issue 5: Cumulative impacts of the pending roadless rule was not adequately addressed.
		Issue 6: Discrimination against the elderly and handicapped is not properly addressed.
		Issue 7: Other Forest existing and reasonably foreseeable Travel Plans have not been properly considered in cumulative impacts.
		Issue 8: Proposed watershed projects need additional analysis.
		Issue 9: Further winter access reductions violate NFMA.
		Issue 10: Big-game retrieval are inadequate.
		Issue 11: Discussed road closures fail to address future needs.
		Issue 12: The rights of resource user currently covered under the permit or lease process is not addressed.
		Issue 13: The removal of Whites Gulch Road #587 from travel planning was flawed. The road qualifies as a 2477 route.
North Belts Travel Plan	#05-01-00-0033	
		Issue 1: Analysis does not contain baseline info necessary for a reasoned decision.
		Issue 2: Purpose and Need are unclear.
		Issue 3: 300 foot design element is flawed.
		Issue 4: Monitoring plans for project are inadequate.
		Issue 5: Insufficient range of alternatives.
		Issue 6: Illegal roads identified since the Tri-State OHV decision (2001) should not be considered and should be closed.
		Issue 7: Decision fails to protect roadless areas.
		Issue 8: Decision and supporting documents do not conform with CEQ regulations.

#### Variability Measure Discussion:

There is not a definitive measure in determining success in keeping publics informed, through educational and environmental programs or in raising the agency's awareness to public concern except to track public participation and involvement by listening to what they're saying and what they're submitting during the programs and events and NEPA/appeal processes.

##### *Variability Measure:*

If issues can not be dealt with under the Forest Plan.

##### *Assessment:*

In evaluating the elements of Community Outreach, SOPA/PALS, Forest NEPA, and Forest Appeals; the Helena NF is able to adapt to the ever-changing public concerns, needs, and desires of their National Forests. As events and programs have been provided, the amount of interest measured in public

participation can give a sense of how well the Helena NF along with partners like the Discovery Foundation is providing timely, current environmental subjects. Attendants of these programs are variable but due address interesting and emerging environmental issues.

The Helena NF addresses issues throughout NEPA & appeal processes. Scoping, scoping, comment periods, and appeal opportunity allow the interested public to be involved and gives a chance to voice concerns and bring to the Helena NF possible perspectives not quite explored. The Helena NF adapts and adjusts actions through management activities such as mitigation that are developed to reduce, avoid, compensate, etc. potential environmental impacts due to the public exchange. The Helena NF also takes learned lessons from a given Forest project and applies what these lessons to the design and development of future Forest projects.

The intent of this variability measure is being met.

*Actions in response to variability assessment:*

As the Helena NF works with the Montana Discovery Foundation and other partners, programs and events can be provided as new and rising issues and concerns become evident. These community events and programs can be offered that address environmental issues in a timely manner.

Through Forest project processes, the Helena NF assesses public raised issues and develop a different strategy or approach in developing Forest projects.

This is an ongoing process in striving to educate our interested publics as well as keeping the Helena NF aware of the public concerns at hand.

**Recommended Efforts:**

Continuation of current efforts are and will continue to be excellent tools in keeping our publics informed to environmental issues and in keeping the Helena NF aware of possible emerging issues and changes in public values in respect to our natural resources. Efforts should be made in searching other avenues of education and potential partnerships in improving public and Forest employee education with changing demands of our Forests and as new forest science brings to our attention different perspectives and awareness of our changing environment.

These described processes are not formal methodology protocols for monitoring item T3 but are formal in their own right and can be used in helping to determine emerging public issues and heightened Helena NF awareness of these issues.

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**(T4) All Resources**

**Forest Plan Requirements:**

Evaluate lands identified as not meeting physical or biological characteristics.

*Intent:*

Verify allocations in the Forest Plan.

**Data Sources:**

EAs, EISs, ID Team evaluation, Ranger District assessments, timber sale feasibility analysis, Landscape Analyses, etc.

### Current Efforts and Findings:

Over the course of managing under the current Forest Plan, 23 plan amendments have been developed. Of these, six of the amendments made changes to management allocations. The following Forest Plan amendments incorporated some level of allocation change:

Amendment #	Description
5	Sheriff Gulch management allocation change
8	Gipsy Creek management allocation change; adoption of Region One old growth definitions
9	McQuithy Gulch management allocation change
10	Amends management allocation travel planning direction for the Elkhorn Mountains
17	Willow Creek AMP management allocation change
18	Poorman Creek management allocation change

It is anticipated that improved inventory gathered since the Forest Plan as well as technological advances will allow for much improved refinement for describing the Forest's physical and biological characteristics during revision.

#### *Documentation of monitoring methodology:*

The methodology or protocol for Forest Plan amendments is described in FSM 1900 Chapter 1920 under 1926.5 – Amendment

Upon receiving advice from the interdisciplinary team that the plan requires change, the Responsible Official shall (paraphrased):

Determine whether changes are significant or not significant

Document determination in a decision document

Provide appropriate public notification.

#### *Monitoring Activity:*

There were no interdisciplinary site-specific projects in 2005 that identified the need for a Forest Plan allocation change.

#### *Data Analysis Methods:*

The determination that no allocation changes were needed was through a variety of environmental analyses conducted in 2005.

#### *Monitoring Results:*

No Forest Plan allocation changes during 2005 were identified.

### Variability Measure Discussion:

All changes will be evaluated annually.

#### *Variability Measure:*

Lands identified as not meeting physical or biological suitability characteristics due to changed conditions or data errors, are evaluated annually through the interdisciplinary project specific processes (NEPA).

***Assessment:***

Through the site-specific due process, data errors and biological and physical characteristics changes are typically discovered during the analysis process in evaluating anticipated effects for a given action. Updates are recorded in the appropriate resource data bases and are used in all future analysis and reporting. Small inclusions of unsuitable lands are typically dropped from project activities and identified in the data base. Larger blocks of unsuitable lands are typically addressed through a Forest Plan non-significant amendment.

The intent of this variability measure is being met.

***Actions in response to variability assessment:***

No actions or responses needed at this time.

**Recommended Efforts:**

Continue the current level of compliance with this Forest Plan monitoring element through the project-specific, interdisciplinary process supported by pre-project (NFMA), resource data collection/surveys and post project monitoring of implementation and effectiveness.

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## **Youth Forest Monitoring Program (YFMP)**

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### **Youth Forest Monitoring**

#### **Background**

The Youth Forest Monitoring Program is a seven week summer internship for high school students who learn forest ecology and field techniques while providing additional forest health monitoring for the Helena National Forest. The program began in 1998 with 4 high school students and 1 instructor. By 2004, there were 9 students based out of Helena and 2 field instructors. Field season 2005 marked the first year that an additional satellite crew of 3 students and 1 field instructor worked out of Lincoln. That brought the total crew to 12 students and 3 field instructors.

Partnerships and funding continued in 2005 to include Lewis & Clark County, Jefferson County, Tri-County Resource Advisory Committee, Montana Discovery Foundation and University of Montana – Helena College of Technology. A second round of funding was allocated from the Secure Rural Schools Funding Act Title II and Title III dollars.

Four teams of YFMP students completed forest health monitoring activities at 30 sites in the Helena National Forest between June and August 2005. Site data, monitoring reports, and presentations are available for review at the Helena National Forest Supervisor's Office. Photopoints were established at each site as part of the data collection process.

#### **Helena Weed Monitoring Team**

Weed monitoring data was collected at 7 sites across the Helena National Forest: Heart Lake in the Scapegoat Wilderness, Hellgate Gulch, Oregon Gulch, Oregon Gulch/M. Brown, South Fork of Crow Creek, Slim Sam and Weston. The focus of this year's study was to compare different management techniques for noxious weeds: biological, chemical and mechanical control.

Cover, frequency, and density data were taken using a TERRA database format. Only the Heart Lake portion of the monitoring continued to utilize ECODATA collection format.

Four recommendations from the Weed Team include: (1) Continue enforcing weed-seed-free hay restrictions in the Scapegoat Wilderness. Noxious weeds have successfully been kept out of the Heart Lake camping area, and compaction of vegetation has decreased since 2005. (2) Monitor annually the spread of cheat grass at the Hellgate Gulch weed monitoring site. There was an average 82% frequency for the presence of cheat grass in 1 m<sup>2</sup> of the study plot. Spotted knapweed was completely eradicated in the study plot which had been sprayed with herbicide in 2002. (3) Include a new monitoring site which was suggested by the Stream Team: Weston Creek riparian area. Weevils introduced in 2003 had made a significant impact on reducing the amount of live thistle. However, there was a large density of houndstongue in the rosette stage that will require further monitoring. (4) Continue monitoring Oregon Gulch/M. Brown which was recovering after the 2000 Cave Gulch Burn. Dalmation Toadflax was aggressively outcompeting other plant species in the study plots. This area was officially turned over to students for study in 2005. It had originally been the product of a 2001 DOW Chemical grant study looking at the effect of two herbicide combinations. Student work at this site also fulfilled a memorandum of understanding that was signed in 2001 between the Helena National Forest, DOW Chemical Corporation, and scientists M. Brown and C. Burton. Most interesting was that of the three burn intensity levels (low, medium, high), at the high intensity burn level, the control area (no pesticide) indicated the lowest density of Dalmation Toadflax. Students hypothesized that this trend over the last five years demonstrated the level of stress on native plant seed banks after severe burns, and how Dalmation Toadflax can aggressively outcompete native plants under these conditions.

### Helena Stream Monitoring Team

The YFMP Stream Monitoring Team collected data at 8 sites on the Helena National Forest. Four of these monitoring sites: Heart Lake, Magpie Creek, Sheps Creek, and Slim Sam Creek were studied in 2004, and again in 2005 due to concerns over drought. Roberts Creek and Weston Creek had last been monitored in 2002. Students also began a new monitoring protocol: taking stream core sampling at known brown trout spawning sites, to measure the amount of silt in the spawning habitat. The higher the silt level, the more likely fish eggs would be compromised. Six stream core samples were taken out of both Beaver Creek on the Helena District and Landers Fork on the Lincoln District.

Stream morphology was monitored through stream channel profile, stream bed composition through pebble count, and stream slope and sinuosity. Water quality data was collected in all streams including temperature, pH, dissolved oxygen, and conductivity. Macroinvertebrate sampling was once again added to the toolbox of monitoring protocol, and compared to previous year's collection data. Grazing, recreation use and mining were the top three impacts on monitored sites.

Top recommendations and observations offered by the Stream Team included: (1) Heart Lake outlet was filled with water this year, allowing for macroinvertebrate monitoring. Over 104 macroinvertebrates were collected on a 200 foot stream length, and 50% of those collected were caddisflies, indicators of good water quality. (2) Pikes Creek has continued to improve since 2002. Originally selected as a monitoring site by students in 2001 based on severe stream bank stress, the D50 of the stream bottom has increased, there is less silt in the water, and macroinvertebrate diversity has also increased. (3) Return to Sheps Creek for further monitoring before 2008. Percent oxygen saturation and dissolved oxygen levels decreased as well as the ratio of sensitive mayfly species to less sensitive worm species in the macroinvertebrate sample, even though the stream was studied at the same time of the summer.

### Helena Soil Monitoring Team

Soils monitoring data was collected by YFMP students at 8 sites on the Helena National Forest. These sites included Bullsweats Unit 9, Heart Lake in the Scapegoat Wilderness, Hellgate Gulch, Oregon Gulch, Pikes Gulch, Slim Sam, Trails Gulch, and Weston riparian area.

Monitoring protocol included soil structure analysis, soil color, soil temperature, vegetative cover, rooting depth, erosion rate, infiltration rate, and downed woody debris.

Recommendations and observations from the Helena Soil Monitoring Team include: (1) Trails Gulch appears to be benefiting from the 2004 prescribed burn. Vegetation cover is low and there is more room between the ponderosa pine tree trunks than in the unburned area. Further monitoring in 2008 may confirm this trend. (2) There was lower vegetation cover in the Weston riparian area that is infested with houndstongue, than in the adjacent non-infested site. 2005 was the first collection of monitoring data at this site. Returning in 2008 will provide better comparison data for cover and infiltration. (3) Priest Pass treatment area should be placed on the monitoring calendar for field season 2006. This area is close to homes in the wildland/urban interface, and will be undergoing a slash/prescribed burn regime.

Monitoring data should be collected before and after these treatments to study the effect of combinations of these treatments.

#### **Lincoln Combined Weed/Stream/Soil Monitoring Team**

The newly established Lincoln Team monitored 8 weeds, streams, and soils sites on the Lincoln District. Poorman's Creek was the only site where previous data was collected by the Helena Crew for comparison. Alice Creek (soils), Alice Creek (streams), Alice Creek, (weeds), Lincoln Ranger Station (soils), Lincoln Ranger Station (weeds), Copper Creek (streams), and Sucker Creek (streams) were all visited for baseline data.

All monitoring methods described above were utilized by the Lincoln Team. Stream core sampling was initiated by students at Alice Creek where six cores were collected.

Recommendations and observations by the Lincoln Team include: (1) Return in 2008 for more monitoring of Poorman's weed site where thistle increased 10% frequency per m<sup>2</sup> in the study plot, while spotted knapweed decreased by 5% frequency per m<sup>2</sup>. (2) Return to study the Lincoln Ranger District study site.

# Appendix A, Decision Flow Diagram

The following flow chart is from the Helena National Forest Plan, page IV/20.

