

HELENA NATIONAL FOREST

# ANNUAL MONITORING REPORT

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F I S C A L   Y E A R   2 0 0 6

*June 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 C1

Seasonal distribution, movement patterns, population structure an 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.

### Variability Measure:

+10% from previous measurements

#### *Assessment:*

##### Elk:

The variation in the total number observed between 2005 and 2006 exceeds the acceptable variation of + 10%. However, it remains within the population objectives for the Hunting District and is not a land management-oriented practice for the Forest. All other variation is within + 10%.

##### Mule Deer:

The variation reflected in the changes between 2005 and 2006 exceed the acceptable variation of + 10%. MTFWP regulates the number of deer in the Hunting District through the hunting permit process; therefore, these changes in variation are not associated with a land management-oriented practice. MTFWP continues to regulate the permit system to adjust for these variations.

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

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

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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. Only aerial surveys were outside the variability for this element.

##### Aerial Surveys:

**Elk** - Total number of elk increase in 2006 by 62% in HD 390 and 87% in HD 391; total number of elk decreased by 6% 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 2005 and 2006 in HD 390 and 391 reflect a >10% increase. The changes in HD 392 are less than 10%. The changes are not related to a management oriented practice.

**Mule Deer** – The total number of mule deer decreased by 24% based on post-season counts and 68% based on spring recruitment counts compared with 2005. MTFWP attributes the spring reduction to high over-winter fawn mortality. These changes are not related to a management oriented practice. This monitoring element is designed to address changes in habitat not necessarily changes in numbers of animals.

**Mountain Goat** - Overall, mountain goat observations have increased by about 28% compared with 2005. This monitoring element is designed to address changes in habitat not necessarily changes in numbers of animals. These changes are not related to a management oriented practice.

*Actions in Response to Variability Assessment:*

There are no actions needed at this time.

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## 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 total number of bighorn sheep observed stayed about the same between 2005 and 2006. The lamb composition decreased by about 15% between 2005 and 2006. Legal rams increased by about 3% in 2006 relative to total counted; in 2006 they made up approximately 12% of the total counted and in 2005 they comprised about 9%.

There is no variation reflected in the total number of bighorn sheep counted between 2005 and 2006. Decreases in lamb composition exceed the -10% variation. Increases in legal rams do not exceed the variation. MTFWP regulates the number of mountain goats through hunting permits; therefore, these changes in variation are not associated with a land management-oriented practice. MTFWP continues to regulate the permit system to adjust for these variations.

*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 2.2 allotment management plan was updated from 2001 through 2006. An average of 4.7 allotments have been updated annually over a ten year period. This variability measure is not being met for the past five year period, but it has been met over a ten year period.

*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. Six allotments are planned for updates in 2007, 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:*

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.

*Actions in response to variability assessment:*

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.

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.

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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:*

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.

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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.

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 the past five years the Forest Plan projected 9,700 acres of harvest. In the past five years the Forest has harvested 3,401 acres. Just as the regulated volume prepared for sale is not a target, the projected acres harvested are not a target, but a ceiling. Deviations below Forest Plan projections are acceptable.

*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:*

A suspected paperwork mix-up necessitates possible Forest action to acquire (re-acquire) water rights on Snowbank Lake.

*Actions in response to variability assessment:*

Work through the Statewide adjudication process for Snowbank Lake. Follow through on water rights application to the State 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.

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**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

*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. 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; 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 2005 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 (implemented on the Forest in fiscal year 2003) was developed to provide statistically valid use estimates. Through traffic counts (road & trail) and visitor exit surveys, recreation use information was 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:*

Condition surveys were last completed at all developed recreation sites on the Helena Forest during 2004. Because condition surveys are not required again until 2009 (as per national protocol), they were not accomplished at the recreation sites 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).

Beginning March 1, 2006 permits for Rental Cabins were issued through the National Recreation Reservation System. A few permits were also issued by the Ranger Districts due to problems associated with implementation of the new reservation system. Permits issued for Forest Rental Cabins document the amount of visitor use at those facilities annually. Unlike the previous year, the Eagle Guard Cabin was made available for yearlong rental in 2006.

Visitor use information was collected during fiscal year 2003 through the National Visitor Use Monitoring Project (NVUM). That information, available in the Helena Forest Supervisors Office, is the most current and accurate recreation use information currently available for the Helena Forest.

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. Based on that information, a reconstruction project was initiated and completed in Vigilante Campground in 2006. While the site was improved to accommodate larger vehicles, trailers and motor homes, the number of campsites was reduced from 18 units to 14 units.

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 2006**

Month	May	June	July	August	September	October
Total Vehicles	67	302	457	289	302	252
Average Weekend Day	12.3	12.8	13.9	11	11.7	12
Average Weekday	18	7.9	15.4	8.3	8.5	5.3
Remarks	Partial Data					

**Gypsy Lake Campground – FY 2006**

Month	May	June	July	August	September	October
Total Vehicles	12	130	223	142	281	164
Average Weekend Day	2.3	6.5	8.9	6.7	11.4	6.2
Average Weekday	1.8	2.7	5.8	3.3	7.3	4.6
Remarks	No data					

**Gypsy Lake Day Use – FY 2006**

Month	May	June	July	August	September	October
Total Vehicles	15	228	352	173	221	101
Average Weekend Day	2	12.2	15.9	8.8	11.4	5.2
Average Weekday	1.8	4.1	7.6	3.5	3.3	1.8
Remarks	Partial Data					

Total recreation use at campgrounds increased in 2006 because the Park Lake Campground was again open for public use. The site was closed the previous year 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.

All sites within the Copper Creek Campground on the Lincoln District were again opened for public use. This resulted in a slight increase in use at developed sites on the Forest. Copper Creek Campground, with 21 camping units, has historically averaged an occupancy rate of approximately 24% during the main operating season.

Snowbank Lake, located on the Lincoln District, has not been stocked since 2004 due to water rights issues. It lost much of its water and as a result, experienced a decline in visitor use.

Rental Cabins on the Forest were occupied a total of 743 nights during calendar year 2006. This represents a decrease of approximately 22% from the previous year. The decrease can be attributed primarily to the change in reservation procedures and use of the national recreation reservation system. All three districts experienced a drop in reservations and cabin use with the new registration system.

In 2006 the Forest initiated and completed a Recreation Site Facility Master Plan (RSFMP) to identify a future program of work. A 5-Year Action Plan was developed and approved by the Regional Forester to focus our recreation emphasis on day use activities. The Action Plan, which still requires public feedback, would implement a variety of strategies to reduce maintenance costs and improve visitor service. It has been determined that work items identified in the 5-Year Action Plan will not be implemented during fiscal year 2007. Prior to implementation, new site fees must be published in the Federal Register and discussed with local Recreation Advisory Committees (RACs).

*Data Analysis Methods:*

The condition of developed recreation facilities is monitored through the Forest Service Infrastructure & Deferred Maintenance reporting system in I-Web. Over a five-year period, condition surveys are accomplished at all developed recreation facilities. The resulting information is entered into the Infra database and revised as changes occur within the sites. NVUM use estimates should be evaluated for notable changes from the previous survey. Documented changes may necessitate management changes at the recreation site such as: increased maintenance and/or identification of capital investment projects.

*Monitoring Results:*

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.

Pikes Gulch Campground on the Helena Ranger District was abandoned during the 1990's. 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). Through analysis of the RSFMP it was decided to drop two existing Rental Cabins from the program, pending heritage assessments. Both the Cummings and Strawberry Cabins have been removed (possibly temporarily) from the National Recreation Reservation System and are no longer available to the public.

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 is 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. It is based on a statistically valid sampling methodology and annual visitor use is influenced 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 assessments should be compared to the 2003 NVUM estimates. It would not be appropriate to initiate management actions based on a + or - 20% variation in NVUM estimates from any one year because visitor use is dependent upon factors such as: weather, fuel prices, and wildfire occurrences. In addition, funding constraints may require a further reduction in the opportunities provided for developed recreation on the Forest.

## 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 and annual 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.

As funding allows, the Forest should begin implementing the 5-Year Action Plan for developed recreation sites in fiscal year 2008 to reduce maintenance backlogs, improve visitor service and meet existing standards.

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## **(A2) Dispersed Recreation**

### **Forest Plan Requirements:**

The Forest Plan requires that Recreation Opportunity Spectrum (ROS) monitoring be completed and then reported on a five-year interval. National Forest recreation opportunities are managed according to a Recreation Opportunity Spectrum. Recreation activities are provided and managed in settings ranging from primitive (wilderness) to urban (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; Employee Observations; Hunter Patrols; 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 variety of recreation opportunities on the Forest.

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).

### **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 activities.

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 primary management activity that influenced the Recreation Opportunity Spectrum in 2006 was implementation of the North Big Belts Travel Plan decision. Through that decision, motorized use was only authorized on specific roads and trails. Several existing but previously established user created routes were closed. Dispersed recreation activities (camping, fishing, picnicking, etc.) in the North Big Belts supported by motorized access may have declined as a result. Because off-route motorized travel was only allowed within 300 feet of designated system routes, access to some recreation opportunities may have been reduced.

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.

In 2006 National Forest lands located adjacent to Park Lake were again open to public recreation use (with the exception of camping). Several areas along the lakeshore were popular and utilized for recreation activities such as: picnicking, fishing, hiking, and relaxation. Past observations by Forest Service employees indicate the amount of recreation use along the lakeshore often exceeded use within Park Lake Campground.

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.

Dispersed camping restrictions in the Copper Creek drainage were dismissed. Visitor use appeared to return to levels noted prior to the Snow Talon Fire.

*Data Analysis Methods:*

Recreation use information obtained through the National Visitor Use Monitoring Project does not provide use figures for any one site on the Forest. However, the report does provide information indicating people use the Helena National Forest for a variety of dispersed recreation activities. Survey information, along with traffic counts, is a helpful tool for future recreation planning. Traffic counts, from survey exit locations on the Forest, provide a snapshot of recreation use occurring in a general area. Public comments provided during the surveys 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

The Hall Creek dispersed site was improved during 2006: new signs were installed, the existing loop road was graveled, and drive-through dips installed. This improvement work was accomplished to correct safety and resource concerns. Trailhead 128 at Hall Creek is a popular camp location and provides access into the Elkhorn Mountains.

A post and pole corral was reconstructed at the Thompson Guard Rental Cabin with help from volunteers from the Back Country Horsemen. The rental cabin provides lodging for visitors who engage in a variety of dispersed recreation activities such as: horseback riding, hiking, hunting, mountain biking, etc.

Dispersed recreation activities continue to remain popular in the North Big Belts following implementation of the 2005 travel plan decision. Travel restrictions probably impacted the type and amount of recreation use in that area but the extent was undetermined. Reconstruction of the Cave Ridge, Never Sweat, and Holiday trails did facilitate increased OHV activity in the North Big Belts.

## 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 will 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 to the established 25% variation.

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

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

## Recommended Efforts:

Dispersed recreation site information should be noted and revised 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 travel planning has been completed on the Forest in 2009, initiate revised ROS mapping to determine consistency with existing Forest Plan direction. At that time it may 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 currently available on the 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.

The Forest should continue to emphasize implementation of the North Big Belts travel decision. In doing so employees should monitor recreation activities to note changes and trends that may be occurring.

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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:*

Field observations, trail conditions, OHV violations, and public comments regarding OHV use are documented at each Ranger District. In addition, OHV violations, warnings, and incidents are documented in the law enforcement database (LEIMARS).

Law enforcement statistics indicate a slight increase in OHV problems on the Helena Forest during fiscal year 2006. There were 18 Violation Notices issued for OHV related incidents in 2006 compared with 3 the previous year. There were 34 Incident/Warning Reports documented for OHV related incidents in 2006 compared with 42 the previous year. The noted increase in OHV violations probably result from an increase in enforcement by Forest employees.

OHV violations occur in areas located throughout much of the Helena Forest. However, there are two specific monitoring reports of note that document OHV violations in 2006. Illegal OHV activity was noted in the Cottonwood and Sweats Gulch areas during the winter closure period. Both areas are located off the York-Nelson Road in the North Big Belt Mountains. The use of motorized vehicles in those areas, off designated routes, has been observed in the past.

Forest employees also documented OHV damage and compliance problems in the Slate Lake area on the Helena Ranger District. There is clear evidence of an illegal ATV trail that was not in existence in 2001. The route is actually located behind a road closed to motorized travel. The road gate has been vandalized as well as the associated closure sign. The rutted ATV route proceeds through a wet riparian area and shows signs of continued use by ATVs. There is a growing problem with OHV use in the Little Blackfoot area and other illegal trails will probably be identified in the future.

In 2006 the Forest again distributed a free travel map of the North Belts and Clancy-Unionville areas. The maps were very helpful and much appreciated by the public, especially the big game hunters. This year there was added emphasis on enforcement (warnings and violations notices) of existing travel restrictions rather than education.

The Keep Cool Lakes area remained closed to motor travel to protect fragile riparian areas. One violation notice was issued for a violation of that special order.

Snowmobile use did not appear to change from 2005. NEPA was initiated for winter travel planning on the Lincoln District.

*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 travel results from the growing popularity of OHV use and the reduced opportunities for OHV use on public lands. The reduction in OHV opportunities is directly related to an increase in motorized restrictions. Motorized sport riding does result in some limited impacts to designated Forest trails.

OHV problems that occurred in 2006 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)

As evidenced by Forest employee observation, a growing problem on the Helena Forest is the illegal use of OHV's that occurs near subdivisions and other private land. 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.

Most of the yearlong closure signs installed in the Magpie and Ridge Road areas were vandalized or removed. Although the signs were once again installed, they were not effective at eliminating illegal motorized vehicle use because some of the restrictions are unpopular with OHV enthusiasts.

The primary method utilized to track OHV impacts has been law enforcement reports and employee monitoring.

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:*

Updated travel plan decisions and implementation of site specific Closure Orders do address critical OHV problems by restricting use. Completion of travel planning on the Forest will reduce OHV violations and the associated resource impacts. It should be noted that the revision of the Forest travel restrictions will not 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 restrictions.

*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.

It is not necessary to ask a Forest ID Team to review and evaluate unacceptable resource damage resulting from OHV use. Individual resource specialists are capable of determining acceptable levels of motorized use based on both resource and social impacts. However, we do 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.

Continue to seek and utilize public input during the travel planning process. Work closely with local user groups to identify acceptable alternatives to travel plan proposals.

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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 2006 that resulted in modifications to Inventoried Roadless lands. The Forest Plan projected considerably more road construction and timber harvest within the Inventoried Roadless lands than has occurred thus far. 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.

**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 2006 that resulted in modifications to Inventoried Roadless lands. This is within the 20,000 acre variation identified with 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; Trailhead registration (voluntary); Limits of Acceptable Change (LAC) for the Scapegoat; Anecdotal information from district personnel.

**Current Efforts and Findings:**

*Documentation of Monitoring Methodology:*

During 2006, 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 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 Service employees indicate that visitor use within both wilderness areas has remained static from previous years.

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

*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 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 28 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 34 sites in the Scapegoat during 2006 using the Limits of Acceptable Change (LAC) protocol (Revision 3, April 2003 form). Pre-season and operating season inspections (following LAC protocols) were completed on all outfitter camps in operation during fiscal year 2006. 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 100 miles of patrol were completed in 15 days, resulting in 22 camp contacts and 25 trail contacts. A total of 55 person days were spent in the wilderness in fiscal year 2006 patrolling, clearing trail, visiting camps, and conducting LAC inventories.

The wilderness ranger and trail crew foreman collect all LAC data for the Scapegoat. Information for the entire Bob Marshall Wilderness Complex is retained and managed by 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

##### Gates of the Mountains

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

##### Scapegoat

In the Scapegoat Wilderness, Opportunity Class (OC) IV trails are managed to accommodate heavy traffic and there are approximately 17 miles of trail in OC IV. In fiscal year 2006, 100% (17 miles) of these trails were cleared to standard, and 50% (8.5 miles) of these trails were maintained to standard.

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 whenever workload permits.
- Opportunity Class II – primary objective of maintenance is for resource protection. Monitored annually whenever workload permits.
- Opportunity Class III – primary objective of maintenance is for resource protection, cleared to standard. Monitored annually.
- 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 traditionally limited, an appropriate number of trail encounters was never established for the Gates of the Mountains Wilderness. Past employee observations confirm the number of encounters would generally meet established ROS criteria for semi-primitive areas (less than 15 encounters daily). The wilderness implementation plan for the Gates does recommend that baseline data be gathered to establish a useable carrying capacity.

##### Scapegoat

Visitor encounters were primarily documented during fall hunter patrols. Approximately 100 miles trails were of patrolled in 15 days, resulting in 22 camp contacts and 25 trail contacts. Noted violations include: three warnings and one citation issued for Food Storage violations; and one camp in violation of the Occupancy and Use order. A total of 55 person days were spent in the wilderness in fiscal year 2006 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 2006.

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

#### Gates of the Mountains

The Moors Mountain Grazing Allotment in the Gates of the Mountains Wilderness, which is grazed two of every three years, is in generally good condition. The Moors Mountain grazing allotment was rested for a second straight year in 2006. The allotment was not grazed because the permittee could not provide a ranger rider as required within the terms of the permit.

In 2006, the Wilderness Institute, as part of the School of Forestry at the University of Montana, completed an inventory of noxious weeds within the Gates. That documented inventory, located at the Helena Ranger District, showed minimal weed infestation along the major trail routes.

#### Scapegoat

Because there are no allotment permits within the Helena portion of the Scapegoat, the range condition is measured by pack and saddle stock use. Popular grazing 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 and reported below under campsite trends.

### Trend and actual use levels

#### Gates of the Mountains

Based solely upon Forest employee observations, it appears visitor 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, 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.

The wilderness implementation 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.

#### Scapegoat

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 requires camping restrictions.

The wilderness implementation 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. In 2006 the Wilderness Institute, part of the School of Forestry at the University of Montana, completed an inventory of campsites within the Gates. The previous inventory was accomplished in 1991. The 2006 inventory indicated that impacts (vegetative damage, litter, fire rings and human waste) have been reduced and most of the inventoried sites have been rehabilitated.

#### Scapegoat

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

There are a total of eight heavily impacts sites within the Scapegoat, four of which (50%) were inventoried in 2006. Campsite impacts/trends for the Scapegoat Wilderness are summarized below by geographic area:

- Bighorn Lake, Valley of the Moon, CDT (Geo unit 5-1-1): Campsite impacts not monitored in 2006.
- Middle Fork, Upper Landers Fork (Geo unit 5-2-1): General trend is a slight decrease in impacts (vegetative damage, litter, fire rings and human waste). This drainage receives consistent use; there are three moderate to heavily impacted sites in the Middle Fork. Three moderately to heavily impacted sites are documented in this area, the same as 2005.
- Mainline Trail, Twin Lakes, North Fork Meadow Lake (Geo unit 5-3-1): General trend is a decrease in 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 located at a cluster of sites on the East Fork in the lower end of the Mineral drainage. They are moderate to heavily impacted.
- Meadow Lake, East Fork of Meadow Creek (Geo unit 5-5-1): General trends show a slight decrease in impacts. The peninsula/shoreline has three sites with moderate impact within a small vicinity; these sites were rated as heavily impacted in 2005. This area is currently out of standard for the opportunity class and we are looking into management plans such as a livestock restriction and campsite rehab. At the East Fork, two of the four sites are moderately impacted.
- Alpine parks, Arrastra and Dry Creeks (Geo unit 5-5-2): General trend is a static level of impact. Fiscal year 2006 shows no decrease in moderately impacted sites (3), or highly impacted sites (1).
- Webb Lake, Parker Lake, Sourdough (Geo unit 5-6-1): General trend is a decrease in campsite impacts.
- Heart Lake, Landers Fork (Geo unit 5-7-1): General trend of impact is static. There are eight moderate to heavily impacted sites at Heart Lake (9 in 2005). 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 and we are out of standard in this opportunity class of IV. Active management should be considered.

#### *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 by limiting impacts associated with visitor use.

#### **Recommended Efforts:**

Trail condition surveys should be accomplished within the Gates and Scapegoat when assigned or as needed. The previous requirement for conducting trail condition surveys on a five-year interval has been

revised. Condition survey information should be utilized to identify critical maintenance needs and develop a 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 to ensure resources are not degraded and impacts are deemed acceptable.

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 or holidays. Campsite inventories accomplished in 2006 and the lack of documented social conflicts indicate visitor use levels are acceptable within Gates of the Mountains Wilderness at this time.

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

In association with the Montana Discovery Foundation, the Helena Forest should initiate additional wilderness education efforts, with special emphasis on implementation of the Gates Education Plan. At a minimum, identify and staff an adequate baseline workforce (both within the agency and through partnerships) for both the Scapegoat and Gates of the Mountains.

#### **Other Monitoring Efforts:**

In 2004 the USDA Forest Service developed a 10-Year Wilderness Stewardship Challenge to help define successful wilderness stewardship. Work completed by the Wilderness Institute in 2006 improved elements #2 and #6 within the Gates of the Mountains Wilderness. The following 10 standards were identified and are briefly addressed below.

Element #1 – Wilderness 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 – 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 – 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 this 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 in place.

Scapegoat – not meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

## **(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). Data are derived from annual 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 2005 and 2006
- Mule deer surveys in Hunting District 380 for winter 2005 and 2006, and spring 2006

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 March 27<sup>th</sup> and 28<sup>th</sup>, 2006 for elk.

Mule Deer:

Aerial surveys were conducted on January 6<sup>th</sup> and April 11<sup>th</sup>, 2006 for mule deer. Surveys are not conducted for moose.

**Data Analysis Methods:**

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

**Monitoring Results:**

Elk:

A total of 2,107 elk were observed in 2006 which is an increase of 362 elk over last year's survey (N=1,745) (See table, below). Because this survey was flown late in the winter, calves were difficult to distinguish from adults. A sample (N = 579) of elk was classified from the air this year with an observed ratio of 24.4 calves: 100 cows (compared to 2005 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 showed some increase in numbers compared to last year; particularly the North Crow, South Crow and Sheep herd segments.

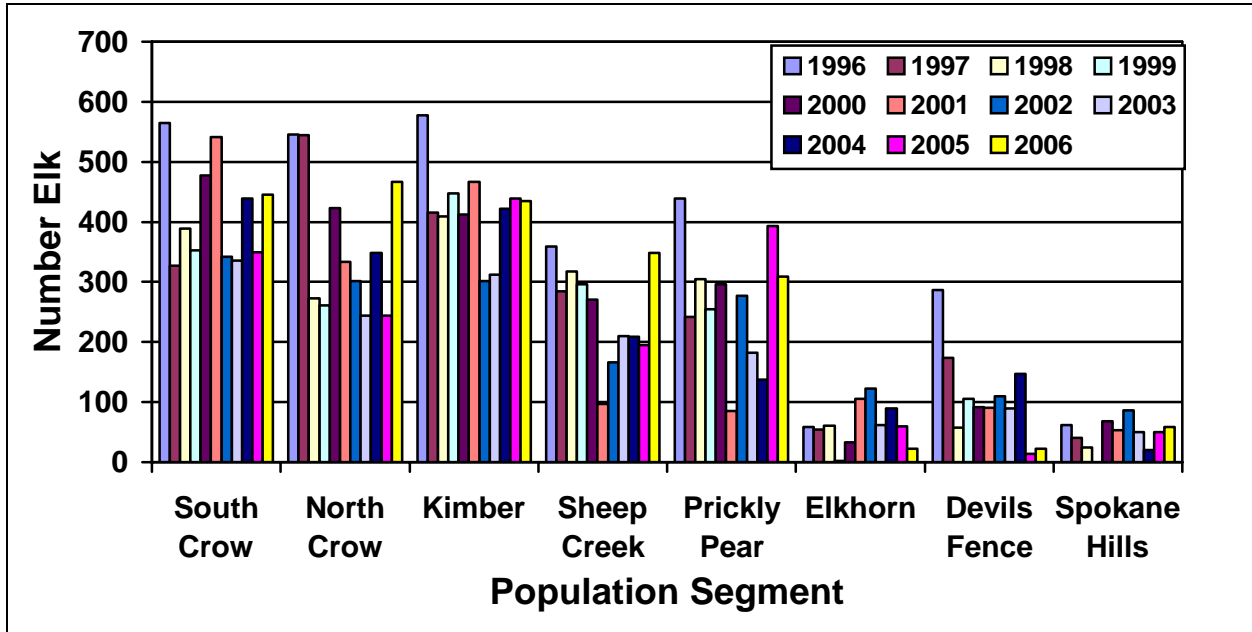
A total of 93 bulls were observed, of which 32 were yearling bulls and 61 were bulls 2 1/2 years old or older. Overall, bull elk made up 4.4% of the total elk counted. Again, this ratio is probably low as it is felt some bulls were missed. The objective in the EMU is to have 10% of the elk population comprised of antlered bulls.

The following table and chart summarize the number of elk in each herd segment from 1996–2006.

Summary of Elk Observations in Hunting District 380 for 2005 and 2006														
Herd Segment	Total		Cows		Calves		Yearling Bulls		Brow-tined Bulls		Total Bulls		Unclassified	
	2005	2006	2005	2006 <sup>1</sup>	2005	2006 <sup>1</sup>	2005	2006	2005	2006	2005	2006	2005	2006
South Crow	350	445	274		71		4	5	1	5	5	10	0	0
North Crow	244	467	171		47		13	10	15	22	28	32	0	0
Kimber	439	435	350		81		7	5	1	4	8	9	0	0
Sheep Creek	195	348	146		36		11	8	2	21	13	29	0	0
Prickly Pear	393	309	285		81		24	1	3	2	27	3	0	0
Elkhorn	60	22	--		--		3	-	18	-	21	-	39	39
Devil's Fence	14	22	0		0		3	2	11	7	14	9	0	0
Spokane Hills	50	59	32		11		1	1	11	-	12	1	0	0
<b>Total</b>	<b>1745</b>	<b>2107</b>	<b>1258</b>		<b>327</b>		<b>66</b>	<b>32</b>	<b>57</b>	<b>61</b>	<b>123</b>	<b>93</b>	<b>39</b>	<b>39</b>

<sup>1</sup>Cows and calves not classified in all herd segments.

Number of Elk Observed in Each Herd Segment, 1996-2006.



Mule Deer:

A total of 591 deer were observed during the winter aerial survey (See table, below). This was a decrease of 195 deer over last year. Aerial surveys were also conducted during the spring of 2006 with a total of 171 deer observed. This continues to be below the 9-year average of 320 (See data in project file).

Fawn production was the best it has been in about 10 years with 44.9 fawns per 100 adults in the winter and 40.5 fawns per 100 adults in the spring. The buck: doe ratio of 14.9 bucks: 100 does (8.9% bucks in the population) was similar to previous years.

Summary of Mule Deer Observations in Hunting District 380 for 2005 and 2006					
Year	Post-Season Total Deer	Fawns: 100 Adults (Post Season)	Spring Total Deer	Fawns:100 Adults (Spring Recruitment)	Bucks:100 Does
2006	591	44.9	171	40.5	14.9
2005	786	25.5	233	26.9	11.1

Variability Measure Discussion:

*Variability Measure:*

+10% from previous measurements

*Assessment:*

Elk:

The total number of elk observed in 2006 increased by about 21% compared to 2005 but was still within the population objective of 1700 to 2300 observed elk. The cow elk and calf composition changes between 2005 and 2006 aren't comparable since the 2006 data were not classified in all herd segments (See Table 1). However, the calf: cow ratio decreased by about 7% between 2006 and 2005. Bull elk made up approximately 7% of the total observed in 2005 compared with 4% in 2006, a decrease of 3%.



The variation in the total number observed between 2005 and 2006 exceeds the acceptable variation of + 10%. However, it remains within the population objectives for the Hunting District and is not a land management-oriented practice for the Forest. All other variation is within + 10%.

*Mule Deer:*

The post season count is down by approximately 25% over 2005; the spring count decreased by 25%. Both the post-season and spring fawn: adult ratios have increased by 76% and 50% respectively. The buck: doe ratio has increased by 34%.

The variation reflected in the changes between 2005 and 2006 exceed the acceptable variation of + 10%. MTFWP regulates the number of deer in the Hunting District through the hunting permit process; therefore, these changes in variation are not associated with a land management-oriented practice. MTFWP continues to regulate the permit system to adjust for these variations.

*Actions in Response to Variability Assessment:*

No actions are needed in response to the variability assessments for elk or mule deer because we are either 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). Ecosystem Research Group (ERG) produced the Elkhorn Vegetation Study Phase II Final Report in 2006 that analyzes and describes habitat and range conditions for the North Crow and Kimber Elk Herd Units in the Elkhorns. The final report is available at the Supervisor's Office and on the Elkhorns Wildlife Management Unit website at: <http://www.fs.fed.us/r1/helena/elkhorns/history/ElkhornsMountainsWorkingGroup.shtml>. See also [www.ecosystemrg.com](http://www.ecosystemrg.com).

**Current Efforts and Findings:**

*Documentation of Monitoring Methodology:*

A detailed description of the methodologies utilized by ERG is located in the "Elkhorn Vegetation Study Phase II Final Report".

*Monitoring Activity:*

Habitat and range conditions were analyzed by ERG as part of a collaborative effort to determine elk/livestock interactions in the Elkhorns. Phase II of that study is reported in this monitoring element which reflects data collected during two field seasons in the Kimber and North Crow Elk Herd Units

(EHU). We provide a synthesis of the habitat and range conditions as described in the Elkhorn Vegetation Study Phase II Final Report”.

*Data Analysis Methods:*

A detailed description of the data analysis methods utilized by ERG is located in the “Elkhorn Vegetation Study Phase II Final Report”.

*Monitoring Results:*

This is the second and final year of data collection in the North Crow and Kimber Elk Herd Units (EHU). ERG concludes that the rangeland habitats in these EHUs are in acceptable condition. The following tables summarize the ecological condition of rangeland in the North Crow and Kimber EHUs. See the Final Report for a description of the conditions.

<b>Ecological Condition of the Rangeland in the North Crow Allotment (acres and percentages)</b>				
<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>	<b>Totals</b>
6,710 (78%)	1,806 (21%)	86 (1%)	0	8,602

<b>Ecological Condition of the Rangeland on the Allotments in the Kimber EHU (acres and percentages)</b>					
<b>Allotment</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>	<b>Totals</b>
East Pacific	833 (57%)	641 (43%)	0	0	1,474
North Beaver	149 (67%)	74 (33%)	0	0	223
Pole Creek	167 (50%)	119 (36%)	47 (14%)	0	333
Whitehorse	483 (42%)	580 (50%)	97 (8%)	0	1,160
Outside Wildlife Management Unit	3,180 (71%)	1,300 (29%)	0	0	4,480
<b>Totals</b>	<b>4,812(63%)</b>	<b>2,714 (35%)</b>	<b>144 (2%)</b>	<b>0</b>	<b>7,670</b>

For the North Crow EHU, ERG concludes that the “ecological condition of the rangeland habitats is lowest on southwest facing slopes in the Crow Creek drainage...” Conifer colonization and noxious weeds are problems in this area. The rangeland habitats in Kimber EHU are in acceptable condition but when compared to the ecological conditions in the North Crow EHU, the rangeland habitats in Kimber are “significantly lower”.

ERG also identified extent of conifer encroachment and its effects on rangeland habitat based in part on Barrett’s “Role of Fire in the Elkhorn Mountains” (See project file). According to ERG, approximately 2,924 acres of encroachment have occurred in the areas where Barrett’s study overlaps the Phase II Vegetation Study Area. Conifer encroachment into grasslands – and most likely sagebrush - has created patches of elk cover that may not have been historically present. The high frequency of fires in grasslands and sagebrush generally limited trees to scattered, small patches. Furthermore, the age-class distribution of sagebrush was probably more varied under historic fire regimes.

Present day forest structure has also changed relative to historic conditions. ERG modeled historic range of variability (HRV) utilizing SIMPPLLE, a modeling system that simulates vegetation patterns and processes (See Elkhorn Vegetation Study Phase II Final Report page 5-11 for more information on the SIMPPLLE process). Contrasts exist between historic and present day forest structure. The following table summarizes those changes.

<b>Forest Size/Structure/Density Comparison for Forested Portions of the Phase II Project Area</b>						
Size/ Structure Class	Presently			HRV		
	Percent Canopy Cover			Percent Canopy Cover		
	15-39%	40-69%	70-100%	15-39%	40-69%	70-100%
Seedling/ Sapling (< 5"dbh)	8.3	22.3	0.2	17.9	9.8	0.0
Pole (5-8.9" dbh)	11.4	0.6	0.0	10.9	0.3	0.0
Pole Two Story	1.6	26.2	0.0	0.7	2.2	0.0
Pole Multi-Story	0.0	1.4	1.7	0.0	0.0	0.0
Medium (9-14.9" dbh)	9.1	0.4	0.4	27.6	10.7	0.0
Medium Two Story	9.1	0.7	0.7	0.0	0.3	0.0
Medium Multi-Story	0.0	2.0	2.0	0.5	0.4	0.0
Large (15-20.9" dbh)	0.6	0.0	0.0	9.2	1.3	0.0
Large Two Story	1.3	0.2	0.2	3.1	2.8	0.0
Large Multi-Story	0.0	0.3	0.3	0.4	0.6	1.2
Totals	41.5	54.3	4.2	70.5	28.3	1.2

#### Variability Measure Discussion:

These data are intended to provide a baseline from which future variability can be measured. Clearly, landscape conditions have changed from historic vegetative patterns as demonstrated by the increase in conifer cover. However, these changes are outside the scope of the Forest Plan and therefore will not be used to measure variability. Future changes on the landscape, either natural or management-related, will be used as an indication of variability in out-years as those data become available.

##### *Variability Measure:*

+10% from previous measurements

##### *Assessment:*

ERG concludes that overall rangeland habitats are in reasonable condition. However, conifer encroachment has affected the amount and distribution of grasslands and forest-structure has changed over time.

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

The Elkhorn Vegetation Study Phase II has provided baseline information that will allow the Forest to determine changes on the landscape over time. Therefore, a variability assessment and any needed actions are not necessary at this time.

#### Recommended Efforts:

Continue working with the Elkhorns Working Group to develop a strategy for implementing recommendations contained in the Elkhorns Vegetation Study Phase II report.

### **(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). Ecosystem Research Group (ERG) produced the Elkhorn Vegetation Study Phase II Final Report in 2006 that analyzes and describes habitat and range conditions for the North Crow and Kimber Elk Herd Units in the Elkhorns. The final report is available at the Supervisor's Office and on the Elkhorns Wildlife Management Unit website at: <http://www.fs.fed.us/r1/helena/elkhorns/history/ElkhornsMountainsWorkingGroup.shtml>. See also [www.ecosystemrg.com](http://www.ecosystemrg.com).

## Current Efforts and Findings:

### *Documentation of Monitoring Methodology:*

A detailed description of the methodologies utilized by ERG is located in the "Elkhorn Vegetation Study Phase II Final Report".

### *Monitoring Activity:*

As part of the Elkhorns Vegetation Study Phase II, ERG collected data to determine elk/livestock interactions. These data were used to determine the extent to which elk and livestock overlapped and how this could affect forage utilization in the Kimber and North Crow Elk Herd Units (EHU). ERG also analyzes elk security habitat in order to provide a context for changes on the landscape particularly those associated with conifer encroachment.

We provide a synthesis of the elk/livestock overlap and elk security analysis as described in the "Elkhorn Vegetation Study Phase II Final Report".

### *Data Analysis Methods:*

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

### *Monitoring Results:*

ERG data indicate that elk/cattle overlap occurs in both the North Crow and Kimber Elk Herd Units (EHUs). (*See Phase II Vegetation Study for methodologies used to determine extent of elk/cattle overlap.*) ERG concludes that generally there is enough forage to support current populations of elk and domestic livestock. However, those areas receiving high levels of dual use have resulted in lower ecological conditions that could increase the potential for noxious weed infestations.

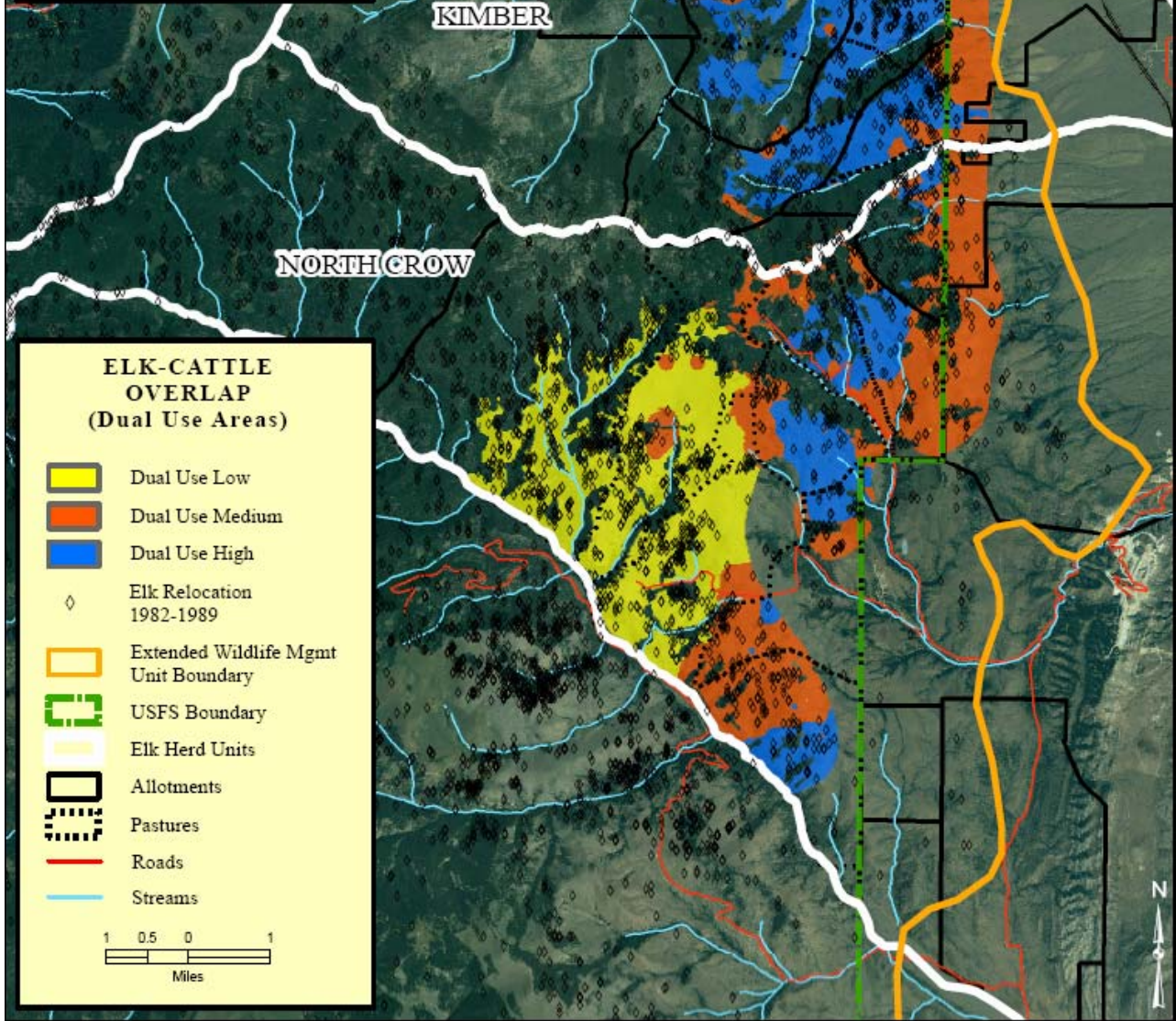
The following figure illustrates the areas of elk-cattle overlap (*From Phase II Vegetation Study*).



**Phase II  
Vegetation Study**  
Elkhorn Working Group

**Figure 4.3-2  
Cooperating Agencies**

\*Data from Montana Natural Resource Information System (NRIS), Rocky Mountain Research Station (SILC3 coverage), Helena National Forest, BLM, Montana Fish, Wildlife & Parks, and Ecosystem Research Group (ERG).



**ELK-CATTLE  
OVERLAP  
(Dual Use Areas)**

- Dual Use Low
- Dual Use Medium
- Dual Use High
- Elk Relocation 1982-1989
- Extended Wildlife Mgmt Unit Boundary
- USFS Boundary
- Elk Herd Units
- Allotments
- Pastures
- Roads
- Streams

1 0.5 0 1  
Miles

The elk security analysis indicates that there is approximately 45% security habitat in the Kimber EHU and 29% in the North Crow EHU. The security analysis is based on Hills et al. (1991<sup>1</sup>) who recommend providing at least 30% security habitat within an elk herd unit.

#### Variability Measure Discussion:

These data are intended to provide a baseline from which future variability can be measured. Future changes in elk and cattle interactions as well as changes in elk security will be used as an indication of variability in out-years as those data become available.

##### *Variability Measure:*

±10% from previous measurements

##### *Assessment:*

ERG concludes that elk/cattle overlap in many areas does not result in poor ecological conditions. This is supported by the data presented in the table above under element C2 on the ecological conditions of rangelands in the Kimber and North Crow Allotments. For example, dual use is occurring in several locations within the North Crow Allotment; however, 99% of its rangeland habitats are in 'good' and 'excellent' condition. As previously noted, though, areas receiving high levels of dual use have resulted in lower ecological conditions that could increase the potential for noxious weed infestations.

Elk security is adequate in both herd units. Changes in conifer cover due to encroachment or other landscape effects have contributed to the pattern of elk security in these herd units.

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

The Elkhorn Vegetation Study Phase II has provided baseline information that will allow the Forest to determine changes on the landscape over time. Therefore, a variability assessment and any needed actions are not necessary at this time.

#### Recommended Efforts:

Continue working with the Elkhorns Working Group to develop a strategy for implementing recommendations contained in the Elkhorns Vegetation Study Phase II report.

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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.

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<sup>1</sup> Hillis, J.M., M.J. Thompson, J.E. Canfield, L.J. Lyon, C.L. Marcum, P.M. Dolan, and D.W. Cleery. 1991. Defining elk security: the Hillis paradigm. In *Elk Vulnerability – A Symposium*. Montana State University, Bozeman, MT. April 10-12.

## Data Sources:

Project EAs, herd unit sampling, forage/browse transects (Forest Plan suggested data sources). Reports, data, and metadata are available at the Supervisor's Office. 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 2005 and 2006
  - Mule deer surveys in HD 392 for winter and spring 2004 and 2006
  - Mountain goat surveys in HD 451 for 2005 and 2006

## 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 and FY06 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 land. Data were analyzed according to the applicable management areas and by elk analysis areas. This year data are also analyzed for all lands within the Forest Boundary.

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 2006 were evaluated to determine if cover and forage values reported in the FY05 Monitoring Report were affected by these activities.

Open Road Densities:

Open road densities were calculated to reflect changes in road status associated with implementation of the North Belts Travel Plan. The data include all lands within the Helena National Forest within the applicable management areas identified above, not just those that are managed by the Forest. This year we also calculated open road density for only those lands managed by the Forest within the respective management areas as well as open road density data for all portions of elk analysis areas managed by the Forest regardless of management area.

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** - Field surveys of roads and motor trails throughout the Divide landscape have been underway for several years in order to assess the nature of impacts on local wildlife. In FY06, general monitoring was limited to the user-created Black Mountain-Ophir Creek motor trail and the Little Corral Gulch trail. Road closure effectiveness was also monitored in the Clancy-Unionville Project Area during hunter patrol. Objectives were to determine the effectiveness of different road closures based on evidence of vehicle use. Field notes can be found in the project file.

**Blackfoot Landscape** - Selected roads, trails and habitat on various parts of the 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. Forest habitats proposed for thinning and/or prescribed burning were monitored for elk and mule deer use in the Alice creek and Poorman creek drainages.

**North Belts Landscape** - A survey of roads and trails was conducted in FY06 during hunter patrol to assess the effectiveness of road closures associated with the North Belts Travel Plan. Information was recorded in field notes and via digital photos. Objectives were to determine the effectiveness of different road closures based on evidence of vehicle use. Field notes can be found in the project file.

Habitat Effectiveness:

**Divide Landscape** - Three grazing allotments in the northern half of the landscape (the MacDonald Pass, Austin, and Empire allotments) were surveyed to assess the impacts of livestock management on the wildlife resource and to determine if adjustments need to be made in the course of reissuing grazing permits.

Further survey work was carried out in the Elliston Fuels project area to better gauge the potential impacts of forest thinning on local wildlife communities. Most survey work went forward in winter and early spring and focused on current big game use patterns in the area particularly with regard to winter thermal cover and potential forage. Track surveys were concentrated in the period from mid-winter through mid-spring when snow was on the ground. Primary habitats monitored were (1) closed mature timber, (2) young conifer/aspen complex, and (3) open grassland. At each of several sites, snow depth was measured, tracks (of any species) were noted, habitat conditions described, and digital photos recorded.

Extensive surveys were also conducted in the proposed South Helena Fuels project area immediately south of Helena. This field effort focused primarily on the likely impacts of proposed mechanical fuels treatments (removal of small diameter conifers) on elk and mule deer. The South Helena Fuels area abuts the Helena city limits and runs through much of the Mt Helena recreation area. The deer population, in particular, is dense and increasing, and it is a prominent issue for residents of Helena and



the wildland/urban interface. Each of the 19 proposed treatment units was surveyed in detail, as to hiding cover, thermal cover, forage quality, weed infestation, human presence, elk/deer use, and other wildlife components.

Field notes can be found in the project file.

Aerial Surveys:

MTFWP personnel conducted aerial surveys in the Big Belts to estimate trend counts for elk, mule deer, and mountain goats.

**Data Analysis Methods:**

General observation data were summarized for a majority of the components in this discussion. GIS analyses were used to calculate open road densities. The methodology is in the project file. No specific statistical analyses were utilized.

**Monitoring Results:**

Cover and Forage:

The following table summarizes the changes in forage and cover between FY05 and FY06. Approximately 56 acres of cover were removed as a result of harvest during FY06. These acres are now considered part of forage.

<b>Changes in Cover and Forage Between FY04 and FY05</b>		
Year	Cover (acres)	Forage (acres)
2005	203,445	128,882
2006	203,244	129,083

Open Road Densities:

Overall open road densities as reported in the FY04 Monitoring Report were 0.8 miles/square mile (based on 2003 data). Open road densities for FY06 are estimated at 0.9 miles/square mile. The changes between 2003 and 2006 indicate an overall increase in road densities of about 1%. This increase is associated with the decision in the North Belts Travel Plan to open roads specifically for hunting season to improve hunter access. The following table summarizes changes in road density by elk analysis area for the management areas associated with this monitoring element. These data are for all lands within the Forest boundary, regardless of management.

<b>Changes in Road Densities by Elk Analysis Areas Between 2003 and 2006</b>			
Elk Analysis Area	2003 Open Road Density	2006 Open Road Density	Percent Change
Arrastra Creek	0.0	0.0	0.0
Atlanta	0.9	0.1	-83.3
Battle Mountain	7.6	7.6	0.0
Beaver Creek	1.6	1.3	-31.2
Birch Creek	1.3	1.3	0.0
Black Mtn - Brooklyn Bridge	0.7	0.7	0.0
Boulder Baldy	0.6	0.6	-0.5
Cabin Creek	0.8	0.8	0.0
Confederate	1.6	1.2	-37.8
Devils Fence	1.6	1.6	0.0
Dry Range	0.5	0.5	0.4
Elk Ridge	2.0	0.7	-127.8

Changes in Road Densities by Elk Analysis Areas Between 2003 and 2006			
Elk Analysis Area	2003 Open Road Density	2006 Open Road Density	Percent Change
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	1.6
Hellgate	0.5	0.4	-7.5
Jericho	1.5	1.5	0.0
Keep Cool	0.7	0.7	0.0
Kimber	0.4	0.4	0.0
Landers Fork	0.1	0.1	0.0
Little Blackfoot	0.3	0.3	0.0
Little Prickly Pear - Ophir	0.2	0.2	0.0
Nevada Creek	2.3	2.3	0.0
North Crow	0.9	0.9	0.0
North Fork	0.4	0.4	0.0
Ogden Mtn	1.3	1.3	0.0
Poorman Creek	1.2	1.2	0.0
Prickly Pear	0.7	0.7	0.0
Quartz	1.4	1.4	0.0
Ray Creek	0.9	0.9	0.0
Sheep Creek	0.7	0.7	0.0
Sixmile	0.0	0.0	0.0
South Crow	0.9	0.9	0.0
Spotted Dog	0.3	0.4	0.0
Wagner/Thomas	1.6	0.3	-135.0
Whites Gulch	0.4	0.4	-6.5

Open road density for the portions of the management areas that are managed by the Forest is 0.6 miles/square mile. Open road density for the elk analysis areas that are managed by the Forest is 0.8 miles/square mile. These data are only for lands managed by the Forest.

*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, 2005. All of the road closures have been effective as there was no evidence of use during monitoring.

**Divide Landscape** - The Black Mountain-Ophir motor trail is still being used by motor bikes. Users do not appear to have done any further work on extending the trail and, in fact, one alternative route appears to have been abandoned.

The Little Corral Gulch trail, which was closed to vehicles in 2003, is still picking up some ATV and trail bike use—primarily due to lack of signing and physical barriers. No off-trail use was noted, however, and the user-made segment that connects down the steep slope into the main branch of Corral Gulch has fallen into disuse.

Road closure effectiveness monitoring in the Clancy-Unionville project area indicated that several closed roads have been receiving motorized use. Many of the road closures had not yet been signed or closed

with a physical barrier and members of the public traveling in the area had to rely on a draft map as this was the first year of implementation.

***Blackfoot Landscape*** - Open road densities have remained fairly constant over the past few years; however some changes in OHV use patterns have occurred. 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*** - Road closure effectiveness monitoring in the North Belts during hunter patrol indicated that several closed roads have been receiving motorized use. Similar to the Clancy Unionville project, many of the road closures had not yet been signed or closed with a physical barrier and members of the public traveling in the area had to rely on a draft map as this was the first year of implementation.

*Habitat Effectiveness:*

***Divide Landscape*** - In the grazing allotments, National Forest land in the Austin and Empire allotments is highly fragmented amidst more extensive private and BLM holdings, and there is little that independent management of the Forest segments can do to specifically benefit wildlife. The MacDonald Pass allotment, however, consists of larger contiguous blocks of National Forest. In general, livestock grazing patterns are light enough and irregular enough to retain sufficient resources for local wildlife. Large patches of tall willows, important to many wildlife species, are only lightly influenced by cattle. More problematic were stringers of wet, productive riparian habitat running down the east side of the Divide that were heavily modified by concentrated cattle use and made substantially less useful to many wildlife species.

Regular inspection of the Elliston Fuels project area throughout the winter and early spring when snow remained fairly deep in forested areas, revealed virtually no elk use. Most elk remained in open grassland habitats across Highway 12 to the north. A few mule deer probed into sites with less snow accumulation throughout the winter. This suggests that thinning of mature forests in this area will have little effect on big game species in winter.

The proposed action in the South Helena Fuels project area would remove substantial hiding cover but retain most thermal cover for big game species. It appears that strategic leave-patches of hiding cover in certain areas can take care of many of the hunting season problems likely to be faced by deer. Be that as it may, the area is currently facing a deer population large enough to be pushing thresholds of social acceptability—and a reduction would not be problematic. Elk, meanwhile, move well out of most of the project area during the hunting season and would be much less influenced by hiding cover reduction.

*Aerial Surveys:*

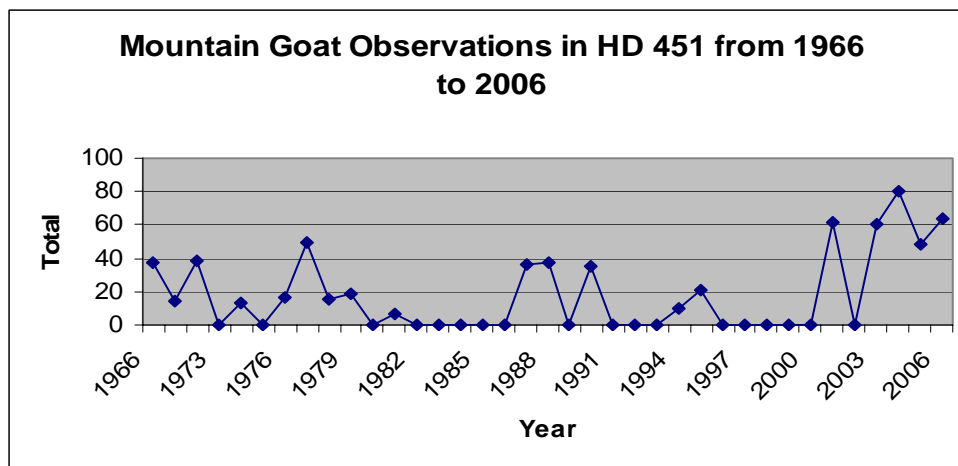
***Elk*** - Survey results for all three hunting districts (HD) – 390, 391, and 392 – indicate an increase in total numbers for HD 390 and 391 and a decrease in HD 392 between 2005 and 2006. Hunting Districts 390 and 392 were within population parameters; HD 391 continues to show an increase in total numbers. The following table summarizes elk numbers by hunting district for 2005 and 2006.

Summary of Elk Observations in Hunting Districts 390, 391, and 392 for 2005 and 2006														
Hunting District	Total		Cows		Calves		Yearling Bulls		Brow-tined Bulls		Total Bulls		Unclassified	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2004	2005
390	995	1613	673	1131	213	295	50	93	59	94	109	187		
391	261	488	155	353	79	91	24	20	3	1	27	21		23
392	1007	951	713	684	222	171	65	62	7	11	72	73		

**Mule Deer** – Surveys were conducted in HD 392 in the winter and spring of 2004 and again in 2006. No surveys were conducted in 2005. The following table summarizes the winter (post-season) and spring counts for 2004 and 2006.

Summary of Mule Deer Observations in HD 392, Winter and Spring 2004 and 2006					
Year	Post-Season Total	Fawns: 100 Adults (Post-Season)	Spring Total	Fawns: 100 Adults (Spring Recruitment)	Bucks: 100 Does
2006	263	43.8	296	24.6	8.7
2004	346	24.1	910	22.7	14.4

**Mountain Goat** - Two surveys were conducted in HD 451 in the Big Belts in 2006; the northern portion of HD 451 and the Mt. Edith-Boulder Baldy of HD 451. A total of 64 goats were observed on both flights combined in 2006 combined with a total of 50 goats in 2005. The following figure summarizes total number of goats observed from 1966 to 2006.



**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 FY05 and FY06 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 2004 and 2006 indicate an increase in road densities of approximately 1%. Based on the monitoring results, this portion of the element is within the acceptable variation of -10%.

*Road Closure Effectiveness:*

***Wagner Atlanta*** – Monitoring in FY05 indicated that two out of the seven road closures were not effective (approximately 71% closure effectiveness). Monitoring in FY06 indicated that all road closures were effective (100% closure effectiveness). The increase in closure effectiveness, 29%, is within the variability measurement.

***Divide Landscape*** - The motorized intrusion into unroaded habitat in the Black Mountain area remains the same as in 2005. The expectation is that this will improve in 2007 with physical closure of the route. Likewise, motorized use of the Little Corral Gulch trail was similar to that in 2005; and it is expected to decline in the future as on-ground signing and blockades are put in place. Motorized use in the Clancy-Unionville project area is also expected to decline as signing and physical barriers are put in place.

***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*** - Motorized use in the North Belts project area is also expected to decline as signing and physical barriers are put in place.

*Habitat Effectiveness:*

***Divide Landscape*** – In the allotments, conditions in the riparian stringers on the east side of the Divide in the MacDonald Pass allotment are probably outside the range of normal variability (with regard to suitable wildlife habitat)—although this condition has remained stable for several years.

Mule deer numbers have been gradually increasing in the wildland-urban interface and in the city of Helena since the mid 1990's. Numbers are probably well beyond historic levels (at least while Indians populations were present in the valley), but within the general range of variation characteristic of the latter 20<sup>th</sup> century. The issue in this case is not low-end population thresholds but of upper-end thresholds. Habitat components (especially winter browse) are still in acceptable condition, but social thresholds (human tolerance) are being approached in some areas. Elk numbers, on the other hand, remain similar to previous years.

*Aerial Surveys:*

***Elk*** - Total number of elk increased in 2006 by 62% in HD 390 and 87% in HD 391; total number of elk decreased by 6% 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 2005 and 2006 in HD 390 and 391 reflect a >10% increase. The changes in HD 392 are less than 10%. The changes are not related to a management oriented practice.

***Mule Deer*** – The total number of mule deer decreased by 24% based on post-season counts and 68% based on spring recruitment counts compared with 2005. MTFWP attributes the spring reduction to high over-winter fawn mortality. These changes are not related to a management oriented practice. This

monitoring element is designed to address changes in habitat not necessarily changes in numbers of animals.

**Mountain Goat** - Overall, mountain goat observations have increased by about 28% compared with 2005. This monitoring element is designed to address changes in habitat not necessarily changes in numbers of animals. These 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:**

Ensure that closure and signing of the Black Mountain and Little Corral Gulch trails go forward if at all possible. Follow up these efforts with regular monitoring (at least once a year) to help keep the closures intact—involving law enforcement personnel if necessary.

Design local fencing exclosures to protect the most productive sites of riparian stringers in the MacDonald Pass allotments from over grazing and trampling by cattle.

Wildlife recommendations for the Elliston Fuels project include retention of hiding cover patches throughout the understory of thinned forest stands, aggressive monitoring of thinned and burned aspen sites to determine if ungulate browsing will suppress regeneration (followed by selective fencing if necessary), and continued monitoring of thinned conifer stands to follow, particular, any changes in big game winter use.

In the South Helena Fuels area, treatments need to be coordinated on the ground with the District wildlife biologist to ensure that leave-patches and other irregular components important to local wildlife are properly structured and distributed.

Continue monitoring OHV use and its potential impacts to wildlife north of Highway 200 particularly in the Copper Creek, Keep Cool, and Sucker Creek drainages where the greatest increase in ATV use has occurred. Monitor potential changes in OHV use on Forest Service managed lands that may result from the permanent OHV closure on a large block of adjacent private lands in 2006 that received extensive OHV use. Also 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.

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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 2006 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 2005 and 2006.

#### 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 11<sup>th</sup>, 2006 by MTFWP.

##### *Data Analysis Methods:*

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

##### *Monitoring Results:*

A total of 162 sheep were counted in 2006, essentially the same as 2005 (N=163). Lamb production was relatively good with a total of 24 lambs observed with a ratio of 36.9 lambs per 100 ewes (compared to 2005 with a total of 28 lambs observed with a ratio of 34.0 lambs: 100 ewes). A total of 54 rams, 19 of which are considered 'legal', were observed but not all of them were classified. A total of 48 rams, 15 of which were considered 'legal', were counted in 2005. 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 stayed about the same between 2005 and 2006. The lamb composition decreased by about 15% between 2005 and 2006. Legal rams increased by about 3% in 2006 relative to total counted; in 2006 they made up approximately 12% of the total counted and in 2005 they comprised about 9%.

There is no variation reflected in the total number of bighorn sheep counted between 2005 and 2006. Decreases in lamb composition exceed the -10% variation. Increases in legal rams do not exceed the variation. MTFWP regulates the number of mountain goats through hunting permits; therefore, these changes in variation are not associated with a land management-oriented practice. MTFWP continues to regulate the permit system to adjust for these variations.

*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 are conducted annually to monitor grizzly bear foraging activities at a known army cutworm moth feeding site. The Lincoln District has been conducting these surveys for several years to document the number of individuals feeding in the area at a given time. This monitoring also



allows for the collection of reproductive information by documenting the number of females and cubs utilizing the area.

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 FY06, 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	Existing Condition (Standard = 0.55 mi/sq. mi)
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.

A moving window analysis was also completed for the NCDE. Documentation of the methodology is on file in the Supervisor's Office. 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.

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 2006.

**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 2006, 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 2006, this conclusion remains in effect.

	1987	2004
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.

**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. Also expand survey efforts to the Crow Peak area in the Scapegoat wilderness which has similar habitat features.

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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 are from "Estimates of Old Growth for the Northern Region and National Forests" 2006, 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
- Project Level Goshawk Surveys for 2006
- Pileated and Hairy Woodpecker Observations
- A Conservation Assessment of the Northern Goshawk, Blacked-Backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region

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

The snag data reported below are from the FY05 Monitoring Report.

#### *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>.
- Monitoring methodology for the Northern Region Landbird Monitoring Program is located at the following websites:  
[http://avianscience.dbs.umt.edu/documents/2004\\_LBMP\\_methods\\_000.pdf](http://avianscience.dbs.umt.edu/documents/2004_LBMP_methods_000.pdf)  
[http://www.fs.fed.us/psw/programs/snrc/featured\\_topics/msim/](http://www.fs.fed.us/psw/programs/snrc/featured_topics/msim/)  
[http://avianscience.dbs.umt.edu/documents/GRIDREPORT\\_2006.pdf](http://avianscience.dbs.umt.edu/documents/GRIDREPORT_2006.pdf)
- FIA snag density estimates are 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.
- 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.

- Methodologies for determining habitat for goshawks and pileated woodpeckers are described in “A Conservation Assessment of the Northern Goshawk, Blacked-Backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region<sup>2</sup>”.

***Monitoring Activity:***

*Old Growth:*

Forest Inventory and Analysis (FIA) data were used to determine old growth acres Forest-wide and are summarized below.

*Northern Region Landbird Data:*

Pileated and hairy woodpecker observations were collected as part of the 2006 Landbird Monitoring Program Grid-Based Sampling. Observations were also summarized for 1994 through 2004. These 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.

*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	Helmville Face
Hey Peggy	South Helena	Indian Meadows
Jimtown	North Divide Grazing Allotments	
Big Log Gulch		
Willow Creek		

*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.

*Conservation Assessment:*

The Forest Service is required by the National Forest Management Act (NFMA) to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives” 16 U.S.C. 1604(g)(3)(B). The Conservation Assessment was developed in order to meet the requirement of NFMA and its implementing regulations by assessing habitat to provide for diversity of species. We report on the goshawk and pileated woodpecker components of that assessment.

<sup>2</sup> Samson, F. B. 2005 (amended March 6, 2006). A Conservation assessment of the northern goshawk, blacked-backed woodpecker, flammulated owl, and pileated woodpecker in the Northern Region, USDA Forest Service. Unpublished report on file, Northern Region, Missoula, Montana, USA.

*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:*

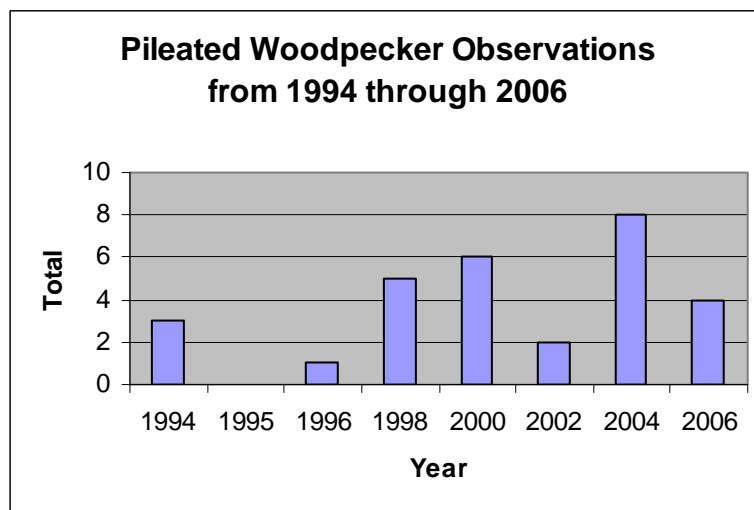
Old Growth:

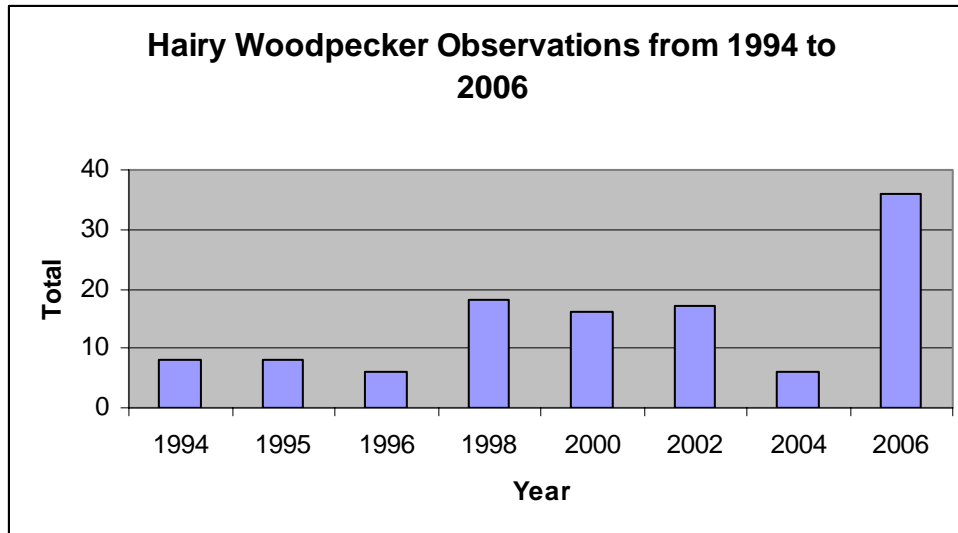
FIA data for the Helena National Forest was collected from 1996 – 1998. Ten percent of the FIA survey points are remeasured annually. The updated report will be forthcoming. The estimated percentage of old growth on all forested lands on the Helena National forest is 10.9% with a 90% confidence interval of 7.8% to 14.1%. In the FY05 Monitoring Report, estimated percentage of old growth was 8.64% with a 90% confidence interval of 5.90% to 11.51%.

Northern Region Landbird Data (from FY05 Monitoring Report):

Pileated woodpecker observations are summarized in the Figure below. Data collected in 2006 are not comparable for those collected between 1994 and 2004. Different methodologies were utilized and the 2006 data are confined to the Big Belts whereas the earlier data are Forest-wide. 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. Data collected in 2006 are not comparable for those collected between 1994 and 2004. Different methodologies were utilized and the 2006 data are confined to the Big Belts whereas the earlier data are Forest-wide. 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

Project-Level Goshawk Surveys:

Two new nests were located in the vicinity of the Hey Peggy project area.

The goshawk nest in the Elliston Face project area was no longer active; but foraging goshawks were observed in the immediate area. However, a new nest was not located.

A goshawk nest (not active at survey time) was located in the South Helena fuels project area on the north side of Mt Helena. The nest was in a riparian stringer of timber in an area of naturally fragmented timber and grassland/shrubland habitat. No goshawks were present in that particular stand, but foraging goshawks were seen elsewhere in the area—often traversing open grassland areas and perching in clumps of trees out in the open habitats.

Goshawks were observed foraging in the Jimtown nest stand in late winter and early spring, but surveys in May-June indicated that no birds nested there this year. Adult goshawks were observed in the Indian Meadows area while conducting surveys but no new nest sites were confirmed. Goshawk monitoring in the Indian Meadows territory found continued use of foraging habitat following post-fire salvage logging that removed dead and dying trees but retained some live green trees.

No goshawks were detected during early season (May) surveys in previously occupied territories in Big Log Gulch and upper Willow Creek. Neither were goshawks detected during surveys in the Cabin Gulch project area.

Pileated and Hairy Woodpecker Observations:

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

Observations of Pileated Woodpeckers by Landscape		
Big Belts	Divide	Blackfoot
Upper Willow Creek	Elliston Face	Helmville Face
Big Log Gulch	South Helena	
Bull Sweats	East of MacDonald Pass	

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

Conservation Assessment:

According to habitat parameters and models developed by Samson (2006), the Helena National Forest has approximately 8,843 acres of nesting habitat, 47,754 acres post fledgling area, and 127,638 acres of foraging habitat. The pileated woodpecker has approximately 5,601 acres of nesting habitat and 14,444 acres of winter foraging habitat. Samson concludes that habitat is abundant for the northern goshawk in the Northern Region and by Ecological Province and by National Forest. Habitat on today's landscape is also very abundant for the pileated woodpecker.

**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:

In 2006, the estimated percentage of old growth Forest-wide was 10.9%. In 2005 it was 8.64%. This reflects an increase in acres reported by about 2%. However, this increase is associated with changes in the calculations used to determine tree age. FIA field procedures record age by counting annual growth rings at breast height (BH). Green et al. use total age rather than breast-height age. To correct for this, a conservative estimate of the number of years a currently large tree took to reach BH is added to the BH age (ring count) to account for the difference between the old growth definition of tree age and the FIA field measurement protocols.

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. This report is considered baseline information for future variability analyses. There is no variability assessment since changes in estimates between 2005 and 2006 are a result of changes in calculation processes.

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.

Pileated and Hairy Woodpecker Observations:

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

Conservation Assessment:

The habitat estimates for the goshawk and pileated woodpecker are based on FIA data. As these data are re-measured and updated, this information will be included in out-year monitoring reports. There is no variability assessment for this report.

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 2002-2006 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. Return to standard monitoring schedule of known goshawk activity centers and of areas likely to harbor goshawk territories as soon as time and resources permit.

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 wildlife surveys in the MacDonald Pass Area, conducted during Winter 2005-2006, by Wild Things Unlimited 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.
- Wildlife Surveys in the MacDonald Pass Area, conducted during Winter 2005-2006, by Wild Things Unlimited

*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 FY06. 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:

Wild Things Unlimited personnel visited the MacDonald Pass Area during five days in winter 2005-2006, to conduct snow track surveys in order to help document general carnivore use levels in the area. Several types of track surveys were conducted: 1) surveys of the roadside along Highway 12, between Mileposts 19 and 31; 2) surveys along secondary roads north and south of Highway 12, including Mullan Pass Road, Priest Pass Road, Lily Lake Road, and Minnehaha Creek Road, and 3) off-road transects north and south of Highway 12.

Along each survey route, detected species of carnivores were recorded, as well as specific locations of carnivore tracks (except for the very common coyote and weasel tracks). General levels of track abundance were also noted for prey species such as snowshoe hare, red squirrel, and grouse, and for ungulates such as deer, elk, and moose.

*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>	
<b>LANDSCAPE AREA</b>	<b>MARTEN HABITAT (ACRES)</b>
BIG BELTS	82,808
ELKHORNS	10,771
DIVIDE	47,190
BLACKFOOT	56,823
TOTAL	197,593

General Habitat Surveys:

Suitable habitat for marten was noted south of the Elliston fuels project area in the Elliston Creek, Kinney Gulch, and Slate Creek drainages, along the continental Divide north and south of MacDonald Pass, on the north side of Black Mountain, Uncle Ben Gulch, and the Left-hand Fork of Deadman Gulch. 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).

Winter Track Surveys:

Tracks of five carnivore species (bobcat, red fox, marten, coyote, and weasel) were detected during the surveys, as well as tracks of three prey species (snowshoe hare, red squirrel, and grouse), and three ungulate species (deer, elk, and moose). No signs of rare carnivores such as wolverine, lynx, or fisher were detected.

**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:

Out-year surveys will provide data to assess variability.

*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 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:*

The eastern reaches of the Elliston Fuels project area, near the Little Blackfoot River corridor were perused for eagle activity and for eagle nests (active or abandoned) during several field inspections of the area—primarily in later winter and spring.

*Data Analysis Methods:*

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

*Monitoring Results:*

No eagle nests were found in the Elliston Fuels project area. Both bald and golden eagles were occasionally observed high over the project area or adjacent areas, but none could be said to be "in" the project area or to be taking advantage of resources there. Although beetle kill has slightly increased the number of large snags that might serve as nesting sites in the project area in the last 2 years, nesting potential for bald eagles remains low because of distance from the river and the availability of suitable nesting sites along the river proper.

**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 this year.

*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**

Additional wildlife monitoring has been conducted across the Forest that is not part of the Forest Plan Monitoring Requirements. These efforts are described below.

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**Peregrine Falcons**

**Monitoring Activity:**

Peregrine falcons have been classified as a sensitive species in Region 1 since removal from the Endangered Species list in 1999, and eyries are still monitored annually. Most eyries on the Forest are in the Big Belt Range. Sites where peregrine falcons have established eyries in recent years were surveyed to see if falcons had returned and to get an estimate of young fledged. Previously-occupied sites checked were at Coulter Canyon, lower Meriwether Canyon, Trout Creek, and Refrigerator Canyon. Other areas that seemed to hold potential as sites for peregrine eyries were perused as well. All 2006 survey work in the northern Big Belts was done by the Montana Peregrine Institute.

### Analysis:

Surveys found three young fledged in the traditional eyrie in Trout Creek Canyon. The eyrie that had been at Coulter Canyon was relocated about a mile down-river at Meriwether Canyon (an area frequently occupied in the past). This eyrie fledged 2 young. The eyrie at Refrigerator Canyon had been taken over by golden eagles, and no peregrines were detected elsewhere in the vicinity. A new eyrie (Sleeping Giant) fledged 3 young.

Peregrine eyries usually shift locations each year. New eyries are often located close to previous year's sites, but sometimes the move is more dramatic (a mile or more). When a new eyrie is relatively distant from the previous location, it is not always possible to locate the new site or to determine if the birds have returned at all. In spite of these difficulties in detectability, the number of eyries located in the northern Big Belts in the last decade has remained relatively constant—generally in the range of 2-4 active sites. The 2006 results are within this general range.

### Recommended Efforts:

Continue to coordinate with the Montana Peregrine Institute in monitoring historic eyrie sites more often, and surveying potential new eyrie sites.

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## Regional Black-backed Woodpecker Surveys

### Monitoring Activity:

In 2006, the Landbird Monitoring Program conducted two bird monitoring projects on the Helena National Forest that focused on black-backed woodpeckers:

- An assessment of grid-based point count sampling utilizing FIA intensified grids. The methodology and results are on file at the Supervisor's Office and located at: [http://avianscience.dbs.umt.edu/documents/GRIDREPORT\\_2006.pdf](http://avianscience.dbs.umt.edu/documents/GRIDREPORT_2006.pdf)
- An assessment of the landbird community in beetle infested areas, primarily the presence of black-backed woodpeckers in recent beetle outbreak areas. The methodology and results are on file at the Supervisor's Office and located at: [http://avianscience.dbs.umt.edu/documents/beetle\\_report\\_final.pdf](http://avianscience.dbs.umt.edu/documents/beetle_report_final.pdf)

### Analysis:

Thirty one point counts and fifty eight playbacks were conducted on the Forest in the beetle infested areas. No black-backed woodpeckers were detected. Three hundred and seven points were surveyed twice as part of the grid-based assessment. The proportion of points with black-backed woodpecker detections was .013 (4 points). These detections were in post-fire areas.

### Recommended Efforts:

No recommendations at this time.

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## Black-backed Woodpecker Surveys/Cabin Gulch, Hey Peggy, and Helmville Face Project Areas

### Monitoring Activity:

Black-backed woodpecker surveys were conducted in the Cabin Gulch, Hey Peggy, and Helmville Face Project Areas. The methodology is described in "Designing Field Studies to Detect Habitat Change for Cavity-Nesting Birds" on file in the Supervisor's Office.

### Analysis:

Approximately 123 points were surveyed in Cabin Gulch, 46 in Helmville Face, and 50 in Hey Peggy project areas. No black-backed woodpeckers were detected in any of the project areas.

**Recommended Efforts:**

No recommendations at this time.

**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 nine 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 2006 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 2006 Final Report is on file in the Supervisor’s Office.

**Analysis**

We located and monitored 26 confirmed nests in the 2006 field season (See table below). Five additional territories were identified but either these nests failed early on in the breeding season or the female never laid eggs because when we subsequently peeped or monitored, there was no evidence of eggs or feeding young. Two of these pairs continued with courtship behavior well into the month of July. The 2006 nest season ran exceptionally late with the last nest (red-naped sapsucker) fledging July 29, 2006. All nests in 2006 were woodpecker nests.

Nest success (percentage of nests that successfully fledged at least one young) in 2006 was 81 percent with 21 of 26 nests fledging at least one chick. Parasites and predation were the most common cause of failure for nests in 2006. Of the nests that were successful (n = 21), the average number of chicks that fledged was 2.9 per nest in 2006. This was close to the 2005 average (2.6 chicks per nest) and the 2004 average (2.7 for 25 nests).

<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	1	0	1	3
	Number of nests that successfully fledged young	1	1	0	1	3
Northern Flicker	Number of nests monitored	0	1	0	2	3
	Number of nests that	0	0	0	2	2

Number of Nests Monitored, and the Number that Successfully Fledged at Least One Young During the 2005 Field Season						
		Unit				All units combined
		MC <sup>1</sup>	MT	SC	ST	
	successfully fledged young					
Red-naped Sapsucker	Number of nests monitored	7	8	0	1	16
	Number of nests that successfully fledged young	6	5	0	1	12
Northern Three-toed Woodpecker	Number of nests monitored	0	2	1	0	2
	Number of nests that successfully fledged young	0	1	1	0	2
Totals	Number of nests monitored	8	12	1	5	26
	Number of nests that successfully fledged young	7	8	1	5	21

**Recommended Efforts:**

There are no further efforts recommended at this time.

**(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 Helena Forest timber 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 allowed 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 ten 1,000 foot sections above and within timer 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 has not occurred since 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 commercial action to remove streamside trees that could become instream pool habitat. Monitoring in 2006 consisted of review of marked INFISH buffers to document that buffers were maintained and that hazard tree removal at campgrounds and

trailheads followed mitigation measures described in the programmatic biological assessment on Recreation Facility Maintenance (USDA Forest Service 2000a).

*Documentation of Monitoring Methodology:*

Monitoring for this element in 2006 was conducted by assessing the implementation of Infish buffers for the Snow Talon Salvage Sale. Marked buffers were field evaluated by fishery biologists to ensure that logging activities did not occur within the marked boundaries. Review of hazard removal trees was assessed to ensure removals met the guidance in biological assessment referenced above.

*Monitoring Activity:*

In 2006 monitoring was conducted to ensure that Infish (USDA1995) buffers were implemented on the Snow Talon Salvage Sale. Individual hazard tree removal within INFISH RHCAs occurred at campgrounds/road and trail crossings. Any hazard tree removal that occurs is required to meet the project description specified in the programmatic biological assessment on Recreation Facility Maintenance (USDA Forest Service 2000a) for which concurrence from the U.S. Fish and Wildlife Service (USDI 2000) was obtained.

*Data Analysis Methods:*

By ensuring the Infish buffers are being implemented, timber harvest and fuels reduction projects outside the buffers have low potential to affect woody debris recruitment. When removal of hazard trees for safety reasons occurs within buffers use of guidelines specified in the Programmatic Biological Assessment for Recreation Facility Maintenance (USDA Forest Service 2000a) ensures effects on woody debris recruitment are minimized.

*Monitoring Results:*

Monitoring of the buffers on the Snow Talon Salvage Sale found that buffers were successfully maintained during logging operations and harvest of trees, that could become woody debris in streams, did not occur (USDA 2006a). Removal of hazard trees at campgrounds and trailheads met guidance in the programmatic biological assessment (2000a).

**Variability Measure Discussion:**

*Variability Measure:*

A decrease in pools from present levels (90% confidence) or removal of large wood from within INFISH buffers for reasons other than safety.

*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 2002-2005 monitoring reports, the recommendation is to rely on meeting the requirements in the Montana Streamside Management Law and the Inland Native Fish Strategy (INFISH) to ensure management activities do not affect woody debris/pools on fishery streams. Project level monitoring on compliance with the SMZ Law and maintenance of INFISH buffers should ensure pool habitat is not affected by vegetation management activities.



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## (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 32 samples as a means to assess existing 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 (Lotspeich and Everest 1981). 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 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 6.4mm in diameter.

#### *Monitoring Activity:*

A total of 32 substrate core samples were collected from four different streams throughout the Forest in 2006 by Forest Service fishery personnel. Streams sampled are shown in the table 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.

In a cooperative effort with the State of Montana to develop a means to provide a broad level approach to initially screen for water quality limited streams, over 600 substrate core samples from Helena Forest streams since 1986 on the Lincoln Ranger District (USDA 2006 and other project file sediment information for streams from both the Townsend and Helena Ranger Districts) were evaluated rigorously via statistical analysis (summary info in project file). The purpose of the evaluation was to try to obtain some broad measure by which to gauge the degree of sediment effect on various streams as compared to an overall reference value. Because the variation around the average value of fine sediments for streams of a specific geology was similar to the variation around the mean value for sediment when findings from all streams were lumped together, the average sediment level for all streams lumped together was determined to be the baseline level to use to assess relative degree of sediment effects. The overall average level of fine sediment less than 6.4 mm in diameter was found to be 35.2% with a standard deviation of 10.2. Consequently for a stream to be significantly different (90% confidence level) from the average (or baseline) and exceed the Forest Plan variability measure, fine sediment levels (less than 6.4 mm in diameter) would have to approach 50%.

*Monitoring Results:*

<b>Fine Sediment Levels and Fredle Indices (Lotspeich and Everest 1981) for Spawning Gravels from Streams Sampled on the Helena Forest in 2006.</b>		
Stream Name	Average Percentage of fine sediment less than 6.4 mm	Average Fredle Index Value
Magpie Creek	39.2	2.9
West Fork Cabin Gulch	45.3	2.9
East Fork Cabin Gulch	38.3	3.2
Deep Creek	38.1	3.1
Hay Creek	Cores not yet processed	----
Snowbank Creek	31.2	5.1
Copper Creek	Cores not yet processed	----

**Variability Measure Discussion:**

*Variability Measure:*

Annual decrease in Fredle Index from present (90% confidence). Since cooperative work assessed values based on fine sediments less than 6.4 mm in diameter a change in fine sediments less than 6.4 mm in diameter (90% confidence) is used for the 2006 data.

*Assessment:*

Limited sampling was conducted in 2006. Samples from Hay Creek and Copper Creek have not yet been processed. Discussion for those streams will be included in the 2007 report. Findings from the other streams are well within one standard deviation of 35% fines except West Cabin Gulch. Even with the high amount of sediment present in West Cabin Gulch it still is within the variability range as discussed in the data analysis methodology section.

Sediment levels for Magpie Creek and Snowbank Creek (both streams impacted substantially by increased sediment flows due to rain events following wildfire) are recovering to pre-fire levels discussed in the 2004 and 2005 Forest monitoring reports. How sediment levels in various streams are affected by wildfire is a useful attribute to assess in terms of the magnitude of effects as well as rate of recovery for: heavily managed drainages, lightly managed drainages, and unmanaged drainages. Coming to a general conclusion can be difficult as sediment levels from individual streams can be quite different. For instance, Magpie Creek was heavily impacted by past human related activities prior to post-fire effects. Post - sediment levels in Magpie Creek were found to be reduced each year the stream was monitored prior to the fire (Harper 2006). The very high levels of sediment prior to the fire have decreased most likely due to the increased flows from the loss of vegetative cover that have occurred over the last few years (Harper 2006). Snowbank Creek although somewhat impacted by human activities prior to being impacted by fire in 2003, had relatively low levels of sediment in stream gravels prior to the post- fire effects. The levels in Snowbank Creek became substantially elevated by high sediment delivery due to summer thunderstorm activity the year following wildfire. Findings from 2006 suggest that levels are nearly back to the 2003 levels in Snowbank Creek prior to the flood event after wildfire.

The cooperative effort with the State of Montana in regard to the analysis of the sediment samples continues to support the concept that evaluating sediment levels in spawning gravels is a useful measurement. The findings from 2006 add to the information base for specialized situations such as how sediment levels in fire/flood affected drainages respond over time. This information will be a useful tool that should help assess risk to fisheries associated with sediment generating management activities in watersheds having various types and magnitudes of natural events or human related activities.

*Actions in response to variability assessment:*

No action is required as variation from the average is within the range of variation allowed for a 90% confidence level.

The forest will continue with 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 this approach has been previously 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). For a stream like West Cabin Gulch it is likely there will be efforts undertaken to reduce sediment delivery from existing levels as part of the upcoming Cabin Gulch Final Environmental Impact Statement.

**Recommended Efforts:**

Monitoring of sediment levels in salmonid spawning substrates should 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 as pointed out in the 2004 and 2005 Forest Plan Monitoring Report Element C-11). There should be continued emphasis to conduct 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 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 whether there is a trend for any increase in sediment levels occurring in the various drainages where management activities have taken place. Sediment sampling of stream substrates should also be continued for streams within drainages where new forest management activities are proposed so that current conditions can be assessed in relation to the broad overall average discussed in the data analysis methods section above.

Based on the cooperative efforts with the State in evaluating sediment levels throughout the Helena Forest (see data analysis methods section earlier) the Forest should consider using the 40% fine sediment level being considered by the State as the level for which a stream is considered impaired.

Sediment sampling of spawning gravels is a reasonable methodology for defining existing conditions in watersheds in relation to assessing the effects of management activities and/or natural events that have occurred. These efforts to determine existing sediment baseline conditions should continue. The baseline information collected can be used in comparison to the 40% level of fine sediment (the level at which a stream may end up being rated as impaired by the State of Montana) to help determine the magnitude of ground disturbing activities that are considered for a drainage. The trend data from information collected throughout the Forest since 1986 suggests that fisheries concerns related to the tendency for higher sediment levels to be 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 and should be continued in the future.

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**(C12) Streamside Cover for Fish (Range Portion)**

**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 under story 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 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)</b>									
Rapid Recovery					Moderate Recovery				
	Functionality/Similarity					Functionality/Similarity			
Resiliency	PFC/High	PFC/Mod	FAR/Mod	FAR/Low	Resiliency	PFC/High	PFC/Mod	FAR/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.									

Annual Flood Plain Soil Disturbance (percent)					
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 (Lloyd 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 six allotment updates in 2006, general fishery reviews conducted on several ongoing allotments, proper functioning condition assessments, allotment utilization measurements, and riparian/migratory songbird assessments. These newer methodologies and evaluation approaches replace the transects and 1000 foot sections identified in the Forest Plan.

#### Current Efforts and Findings:

Cowfish (Lloyd 1985) monitoring was discontinued in 1992. Presently monitoring of forage use and bank disturbance on allotments west of the continental divide is conducted as part of implementation monitoring for bull trout required by the U.S Fish and Wildlife Service biological opinion (USDI 1998 pgs 98-99) 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 and specified in the Terms and Conditions of the most recent Incidental Take Statement from re-initiation of the formal consultation for several livestock grazing allotments on the Helena Forest by the U. S. Fish and Wildlife Service (USDI 2002).

General fishery evaluations, biological assessments, and biological evaluations were completed in 2006 in association with updates to six livestock allotments (Baldy, Empire, MacDonald Pass, Austin, Gould, and Shingle Mill Allotments). Additionally, general fishery reviews were conducted for ongoing livestock grazing activities on various other grazing allotments. Ongoing allotments where effects to fish habitat were evaluated as a general fishery review included portions of the Spring Gulch, Ophir /Hope, Grassy Mountain, Deep Creek, Gurnett, and Drumlummon Allotments.

Implementation monitoring efforts have shown that the Forest has met stubble height requirements on allotments west of the continental divide with one exception (findings from Helena Forest Implementation monitoring-in project file). The bank disturbance monitoring conducted as part of the implementation monitoring module and established transects on biological term and condition monitoring sites has also indicated that levels are being met on specific sites monitored on 4 allotments west of the continental

divide with three exceptions; all on the Blossburg Allotment (2006 Blossburg Allotment Inspection Notes from Helena District range personnel in project file).

However, spot evaluations conducted by fisheries personnel at other locations on two allotments indicated that bank disturbance was exceeded on some reaches of Spring Gulch on the Spring Gulch and Ophir /Hope Allotments as well as Hope Creek on the Ophir/Hope Allotment (detail in project file). General fishery evaluations on the Spring Gulch allotment indicated that livestock grazing was having severe detrimental effects to westslope cutthroat trout populations. Additionally, evaluations by Montana Department of Fish Wildlife and Parks Fishery Personnel and Forest Service Fishery personnel found detrimental effects occurring to cutthroat trout on Skelly Gulch within the Drumlummon Allotment (documentation in the project file). General fishery evaluations conducted on several tributaries to Hay Creek on the Grassy Mountain Allotment documented negative effects to fish habitat due to high bank disturbance levels (details in the project file).

*Documentation of 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 [www.fs.fed.us/rm/pubs\\_other/rmrs](http://www.fs.fed.us/rm/pubs_other/rmrs)). For livestock grazing, use of the residual stubble height of vegetation on the greenline is the minimum monitoring element associated with the Implementation Monitoring. 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. Bank disturbance levels are not to exceed 20% and beginning in 2006 a standardized protocol for measuring bank alteration for national forests in Region 1 was adopted (USDA 2005). Sites to be monitored on the various grazing allotments in 2006 are specified in a letter to the US Fish and Wildlife Service (USDA 2006c).

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

Biological Assessment - A standardized format for the assessment is used for proposed activities as agreed to by the Montana Bull Trout Level 1 Team. 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 (2000b) and Blackfoot (USDA 2000c) Bull Trout Section 7 Watersheds. These documents are also part of the project files.

Biological Evaluation - The biological evaluation only assesses effects to westslope cutthroat trout on the Helena Forest. This process is very similar to what is discussed above for biological assessments, except that 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 does not follow the format used west of the continental divide.

General Fishery Evaluation. For proposed activities a no effect checklist 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 are included in documentation. This No Effect

Checklist is used in place of an in-depth biological analysis or biological evaluation if no effects for an activity are projected. Review of ongoing activities that can affect riparian habitat related to fisheries is accomplished using walk through evaluations with notation documented in regard to effects or concern for possible effects to fishery resources.

#### 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 2006 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:*

#### Shading of Streams and Fish Habitat.

Grass stubble heights are measured along the greenline of riparian areas. 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. Walk-through surveys estimating bank disturbance by pacing was the methodology used.

General fishery reviews entail walk-through surveys utilizing visual estimates for streamside forage conditions as well as bank disturbance levels.

*Livestock Utilization Monitoring*

Livestock forage utilization was measured on twenty-nine streams, within seventeen allotments. The following table shows riparian monitoring that was completed in 2006 using paced transects.

2006 Riparian Monitoring				
Allotment	Riparian Area	% Utilization	% Browse	% Streambank Trampling
Deep Creek	Mike Day Creek	15		
	Left Fork of Faulkner Creek	40		
	Middle Fork of Faulkner Creek	50**		40**
Alice Creek	Upper	30		7
	Middle			9
	Lower			5
Canyon Cr/Sandbar	Sandbar	8		5
Chimney Creek	Chimney			22
	Rossin	35	5	5
East Nevada	Nevada	25		10
	Washington			
	Jefferson			10
Horsefly	Black Diamond			3
Moose Creek	Moose	38		3
	Wasson	10		6
Stonewall	Beaver	35		18
West Nevada	Madison	40		3
Willow Creek	Willow	35	5	18
Blossburg	Dog Creek	80**		49**
Grouse Ridge	Bowman	10		
	Fantail	10		
	Trout	40		
Hat Creek	Hat Creek	10		12
Maupin	Strawberry	35		
Ophir/Hope	N. Fork Ophir Creek			11
	Hope Creek	85		
Slate Lake	Elliston Creek			41**
	Slate Creek	65**		
Spring Gulch	Spring Gulch	40		

*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, in regard to effects to fish habitat, 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 present.

Livestock utilization data were summarized from field observations and surveys.

#### *Monitoring Results:*

Biological Opinion monitoring conducted west of the continental divide in 2006 has indicated that bank disturbance levels have been exceeded for three important stream reaches of Dog Creek on the Blossburg Allotment (2006 Blossburg Livestock inspection notes and other documentation in the project file). General surveys conducted by fishery personnel indicated that bank disturbance levels were exceeded on reaches of three other allotments west of the divide (Spring Gulch, Ophir /Hope, and MacDonald Pass). East of the divide bank disturbance levels were high on some stream reaches of the Grassy Mountain, Deep Creek, and Ray Creek Allotments (Field notes from the Hay Peggy Field Review 2006- in project file). On the Gurnett Allotment bank disturbance levels were greatly reduced on a fork of Duck Creek by having the permittee defer grazing the stream reach of concern 2006. Consequently negative effects to the cutthroat trout were greatly reduced. General monitoring by Forest Service soils specialists documented riparian degradation on the headwater reaches of Colorado Gulch.

Biological assessments, biological evaluations, and fishery effects analyses were completed on several allotments (Macdonald Pass (Walch 2006a, 2006b, 2006c, 2006d, 2006e), Baldy (Harper and Walch 2006a), Austin (Harper and Walch 2006b), Empire (Harper and Walch 2006c and 2006d, Walch 2006f) , Gould (Burns and Walch 2006a, Walch 2006g), and Shingle Mill (Burns and Walch 2006b and 2006c) ). The above documents assessed that fish habitats have been affected by grazing to varying degrees, but effects were concluded to be insignificant where significant is defined as an effect large enough to result in reduced viability for the local fish populations present.

For the livestock utilization assessment twenty-nine riparian areas were monitored on seventeen allotments. Three riparian areas exceeded the utilization standard, while three riparian areas exceeded the streambank trampling standard.

Of the twenty-nine riparian areas where livestock grazing was monitored in 2006, three 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.

#### **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 HSI, 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.

Helena Forest Riparian Guidelines (USDA 1998- in project file) are used as a means of maintaining shading and minimizing bank disturbance for the allotments east of the divide. In 2006, bank disturbance was the primary factor evaluated for the allotments evaluated by fisheries personnel and it was assessed visually in relation to the Helena Forest Riparian Guidelines (1998).

*Assessment:*

Since Cowfish (Lloyd 1985) is no longer used, the Cowfish HSI variability was not used in 2006. Findings from stubble height monitoring, bank disturbance monitoring, the various biological evaluations conducted during grazing allotment updates, and general fishery reviews on other livestock allotments indicate that fish habitat associated with riparian habitat condition and fish populations continue to be affected negatively to varying degrees on a number of grazing allotments across the Forest. Effects to fish habitat vary from minor to adverse and are documented, for the allotments reviewed, in project file memos, field notes, and correspondence.

Findings from the Implementation Grazing Monitoring and general fishery reviews for bull trout west of the continental divide indicates that although stubble height requirements are being met, bank disturbance levels on some stream reaches continue to be exceeded on four grazing allotments (Blossburg, Ophir/Hope, Spring Gulch and MacDonald Pass) with likely adverse effects to fish habitat and fish populations on those allotments with the exception of the MacDonald Pass Allotment. Evaluation of the Clark Canyon Allotment by fishery personnel did not occur in 2006 so it is unknown as to whether negative impacts found in 2005 were mitigated in 2006.

There is no baseline information to compare the livestock grazing riparian monitoring to, outside of the above allotments. Of twenty-nine streams measured, three exceeded Forest Plan standards while twenty-seven 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.

*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 Forest developed riparian guidelines (USDA 1998) to utilize as a means to achieve the Riparian Standards in the Forest Plan. The Forest continues use of the new guidelines under Helena Forest handbook direction as a means to meet the riparian guidelines and Helena Forest Riparian Standards through direction provided to allotment permittees via grazing allotment annual operating plans and as an inherent component of new allotment management plans. If the Helena Forest Riparian Guidelines were to be implemented effectively, negative effects to riparian areas from livestock would be minimal and there would be little need for any amendment to the Forest Plan. Consequently efforts to better implement the Riparian Guidelines (1998) will continue.

Based on findings and recommendations discussed in the 2005 monitoring report, livestock grazing was not to occur on the riparian portion of the Fork of Duck Creek (Gurnett Allotment) in 2006 and that effort was mostly successful with only a few livestock found in the pasture. The reach on the North Fork of Deep Creek, discussed as a problem reach in 2005, was fenced in 2006 to exclude livestock. Efforts to reduce negative livestock effects to westslope cutthroat trout on Spring Gulch (Spring Gulch Allotment) were unsuccessful and substantial bank trampling on a reach critical to westslope cutthroat trout occurred. Consequently additional assessments by range and fishery personnel are planned for Spring

Gulch in 2007. The Fish and Wildlife Service was informed of the failure to meet bank disturbance standards on several stream transects on Dog Creek and Spring Gulch in the Blossburg and Spring Gulch Allotments and re-initiation of formal consultation to address adverse effects on bull trout habitat will likely occur in 2007. A drift fence on Ray Creek (Baldy Allotment) was installed to limit bank disturbance on an important fishery reach of Ray Creek (Baldy Allotment). Assessments by range and fishery personnel to reduce problems on Skelly Gulch (Drumlummon Allotment) were initiated with fishery personnel from the Montana Department of Fish, Wildlife and Parks, but additional planning is planned in 2007 to fully address the concerns. There are plans in 2007 for a riparian restoration project in the headwaters of Colorado Gulch (Frohner Allotment) which were initiated by soils personnel in response to problems identified in 2006.

In addition to the ongoing efforts to 1) implement the Helena Forest riparian guidelines, 2) document problem riparian areas, and 3) address problem riparian areas within allotments, 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. 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. In 2006 extensive maintenance was conducted on portions of the enclosure on Elliston Creek and minor maintenance was conducted on the enclosure on Meadow Creek. Additionally, other measures have been taken over the last several years to reduce impacts of livestock grazing to riparian habitats and associated fish habitat on several stream reaches through the use off-stream water developments (tributaries to Slate Creek and Dog Creek). Plus, there are plans for a new water development and possibly a riparian fence in the MacDonald Pass Allotment in response to findings in 2006, but construction may not occur until 2008.

Livestock were removed early from the Deep Creek, Blossburg, and Slate Lake allotments due to riparian use levels in 2006.

#### **Recommended Efforts:**

There is a need to move livestock out of pastures in a timely fashion so that the bank disturbance portion of the Helena Forest (1998) Riparian Guidelines is not exceeded on stream reaches highly susceptible to being damaged by livestock grazing. To ensure livestock is moved prior to bank disturbance levels being exceeded, additional review of riparian habitats is needed on many allotments. Based on current information, the allotments most important to review from a fishery aspect and possible effects on bull or westslope cutthroat trout include Blossburg, Spring Gulch, Ophir/Hope, Clark Canyon, Gurnett, and Drumlummon. The Grassy Mountain and Deep Creek Allotments need additional reviews to reduce impacts to riparian and fish habitat supporting brook trout. 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.

Specific efforts to further reduce bank trampling should be undertaken on portions of Dog Creek (Blossburg Allotment, Spring Gulch (Spring Gulch Allotment), Hope Creek and Spring Gulch (Ophir/Hope Allotment), Skelly Gulch (Drumlummon Allotment), Clark Canyon Creek (Clark Canyon Allotment), , and portions of Hay Creek and selected tributaries (Grassy Mountain and Deep Creek Allotments). For the Fork of Duck Creek (Gurnett Allotment) continued exclusion of livestock is recommended for the reach critical to westslope cutthroat trout egg survival. 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 and could be effectively used to protect stream reaches mentioned above.

The following efforts should continue: 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 and populations through biological evaluations, biological assessments, general

fishery reviews, and continued range utilization studies (Forest Plan Monitoring D-elements). From a fisheries perspective, continuation of monitoring to determine bank disturbance levels on the Blossburg, Spring Gulch, Ophir/Hope, and Hat Creek Allotments is an important element to continue as part of meeting the terms and conditions in the biological opinion from the Fish and Wildlife Service.

For streams east of the continental divide on the Helena National 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. These baselines provide a comprehensive and standardized documentation of existing habitat conditions based on all past and ongoing activities and are very helpful in conducting cumulative effects analyses.

As a means to characterize and quantify the amount of riparian habitat affected by livestock grazing and the degree to which that habitat is affected by livestock grazing on the Helena Forest, it is recommended that a Forest-wide effort be undertaken to characterize the amount of riparian habitat within each allotment, characterize the various levels of sensitivity of that habitat to being damaged by livestock grazing, and finally assess and record the condition of those habitats. Vegetation types, stream gradients, as well as overall geology and specific soil types are some of the attributes that should be used as an initial means to assess the susceptibility of riparian habitats to being damaged by livestock grazing.

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## **(C12) Streamside Cover for Fish (Wildlife Portion)**

### **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 EA's, 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.

### **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; and information from 25, 1000 foot sections.

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

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 and is excerpted from the FY05 Monitoring Report since there are no new data to report at this time.

#### *Documentation of Monitoring Methodology:*

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

### *Monitoring Activity:*

#### *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>3</sup>). Grazing has been identified as the major factor affecting wildlife habitat productivity in the western U.S. (Kauffman and Krueger 1984<sup>4</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:*

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

#### *Monitoring Results:*

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.

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<sup>3</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>4</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

Summary of Transect Results for the Riparian Willow Study					
Quad	Transect #	Number of Points	Number of Visits	Treatment <sup>1</sup>	Number of Bird Species
Whites City	1207	6	3	High	36
Six Mile Mtn.	1201	7	3	High	33
Nelson	1203	8	3	High	48
Esmeralda Hill	1205	7	3	Moderate	34
Greenhorn Mtn.	1208	6	3	Moderate	33
Bison Mtn.	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.

Summary of Bird Species (mean) <sup>1</sup> by Treatment Type			
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 (HIS) from present as measured by Cowfish Model (90% confidence) or a HIS of less than 0.6 as measured by Cowfish.

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:*

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.

*Actions in response to variability assessment:*

Recommendations to develop a Forest plan amendment to address effects of livestock were included in 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:**

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 2006 aquatic invertebrates were collected on nine streams by the Helena Youth Forest Monitoring Group. Based on analysis procedures of the invertebrates water quality was rated as good to excellent.

*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 nine streams.

*Data Analysis Methods:*

Data is to be analyzed using the Biotic Condition Index or BCI (Winget and Mangum 1979 page 23). However, for 2006 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:*

Stream Name	Aquatic Invertebrates Present (classed to order)	Diversity Index Value	Pollution Tolerance Index
Slim Sam Creek	Stoneflies, caddis flies, mayflies, midges, worms, alder flies, midges, snails, black flies	2.22	2.55 (good rating)
South Fork Crow creek	Stoneflies, caddisflies, mayflies, crane fly, worms	1.72	2.0 (excellent rating)
Eagle Creek	Stoneflies, caddisflies, mayflies, alderfly midge, worms, black flies	1.89	2.28 (good)
Buffalo Creek	Stoneflies, caddis flies, mayflies, alderflies, worms	1.5	2.0 (excellent rating)
Corral Creek	Stoneflies, caddisflies, alderflies mayflies, worms	1.7	2.0 (excellent rating)
Magpie Creek	Stoneflies, caddisflies, mayflies,, crane fly, mdige, worms	0.89	2.3 (good)
Vermont Creek	Stoneflies, caddisflies, mayflies, crane fly, worms	1.2	2.1 (good)
Sulphur Bar Creek	Stoneflies, caddisflies, mayflies, worms	1.4	2.25 (good)
Deep Creek	Stoneflies, caddis flies, mayflies	5.7	1.6 (excellent rating)

**Variability Measure Discussion:**

*Variability Measure:*

Currently stated as annual decrease from present in Biotic Condition Index (90% confidence). The limited data from 2006 is not adequate to make any conclusion as to whether there is or is not a change in the BCI forestwide.

*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 (e-mail correspondence D. Perkinson 6/3//93, P.Cross 6/3/93, B Riggers, 6/3/93, B. Sanborn 6/3/93, B. May 6/3/93, 6/4/93, and email from L Walch 6/3/93 documenting conversation with Bob Bukantis from the Montana Water Quality Bureau). 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. It would be useful to have aquatic invertebrates evaluated in the West Fork of Cabin Gulch (shows very high sediment levels) to see if the abbreviated sample methods are sensitive enough to detect changes related to the much higher sediment levels present.

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**

**(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:

Allotment	Sale Area	Survey Year	Damage noted
Deep Creek Grassy Mtn.	Toston/Maudlow Fire Salvage	2002-2006 ongoing	None Reported
Magpie	Cave Gulch Fire Salvage	2002-2006 ongoing	None Reported
	Snow Talon Fire Salvage	2004-2006	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.

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**(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 state (II/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 Mountain Grassland, Palouse and mixed Grass Prairie Resettlement Range	Moist Ranges 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 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	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><u>20% Maximum Disturbance</u></b> = Moist ranges good – excellent condition on slopes 0-15%.  <b><u>15% Maximum Disturbance</u></b> = Fair condition moist ranges. Dry ranges – fair condition under 15% slopes, good or

Grazing System	Allowable Use of Total Forage Produced High Good to Excellent Condition Class		Allowable Soil Disturbance or Recovery Criteria
	Dry Ranges	Moist Ranges	
	Mountain Grassland, Palouse and mixed Grass Prairie Resettlement Range	Mountain Meadows, Bluegrass Bottoms	
recommended for condition class			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
<b>Stage 1</b>	50%	45%	60%	50%	40%	45%
<b>Stage 2</b>	45%	35%	50%	40%	30%	35%
<b>Stage 3</b>	35%	25%	35%	30%	25%	20%
<b>Stage 4</b>	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 a portion 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 One 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	55		40		48
Ophir Hope	A				33	33
Slate Lake	A			35		35
Spring Gulch	A				50	50
Alice Creek	A	25	35	37		32
Chimney Creek	A				40	40
East Nevada	A				40	40
Moose Creek	A	35		35		35
Stonewall	A				40	40
West Nevada	A				35	35
Willow Creek	A				40	40
South Crow	A	72		52		62
Pole Creek	A	30	38	59		42
Whitehorse	A	20	23			22
Camas Creek	A	22	21			22
Baldy	A				13	13
Deep Creek	A	37	24	38		33
Avalanche	A	No Monitoring				
Magpie	A		36	22		29
Summary of "A" Allotments Monitored:	18	37	30	30	36	36
19 "A" Allotments total, 18 monitored:						
Cellar Ogilvie	B		23			23
Grouse Ridge	B	40		20		30
Hat Creek	B			50		50
Maupin	B	25				25
Nelson Favorite York	B			80		80
Ten Mile Priest Pass	B				30	30
Canyon Cr/Sandbar	B				15	15
Horsefly	B		10			10
Keep Cool	B		15			15
Shinglemill	B				40	40
East Pacific	B	25				25

Allotment Name	Ranking (A, B, C)	Timing of Use				Average Use %
		Early	Mid	Late	Continuous	
Summary of "B" Allotments Monitored:	11	30	16	50	28	31
27 "B" Allotments total; 11 monitored						
Austin	C	10				10
Dog Creek	C				25	25
Gould	C				30	30
Tarhead	C				40	40
Summary of "C" Allotments Monitored:	4	10			32	26
32 "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 2004-2006 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-three of the seventy-eight active allotments in 2006, thirty-nine of the active allotments in 2005 and thirty-four of the active allotments in 2004. Of the thirty-three allotments monitored, 95% of the "A", 41% of the "B", and 13% 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%, in 2005 it was 30% and in 2006 it was 42%. The average of the three years was 36% and when compared with the 2006 average of 42%, there is a 6% difference.

The utilization constraints of the Forest Plan and FSM Range Analysis handbook actual use standards by livestock were met approximately on 82% of the thirty-three allotments monitored in 2006.

**Variability Measure Discussion:**

***Variability Measure:***

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

***Assessment:***

As noted above, the variance for 2006 as compared to average of years 2004-2006 was 6%. This element was met for 2006 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. A three year period was provided for the 2006 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



District	Allotment Name	NEPA Decision Date
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-Ogilvie	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		
2	Austin	27-Sep-06
1	Baldy	16-Feb-06
2	Big Buffalo	23-Jan-06
2	Empire	27-Sep-06
2	Frohner	23-Jan-06
4	Gould Creek	26-Sep-06
2	Little Buffalo	23-Jan-06
2	Macdonald Pass	27-Sep-06
2	Quartz Creek Rowe Gulch	23-Jan-06
1	Weston Spring	14-Jul-06
Total number of allotments updated in 2006: 11 allotments		

*Data Analysis Methods:*

These are observational data which have been summarized.

*Monitoring Results:*

Nine allotment management plans were updated from 2001 through 2006. A total of 47 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 2.2 allotment management plans were updated from 2001 through 2006. An average of 4.7 allotments have been updated annually over a ten year period. This variability measure is not being met for the past five year period, but it has been met over a ten year period.

*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. Six allotments are planned for updates in 2007, 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) are 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.

One hundred eighty-four biological release sites and 30 herbicide treatment sites were monitored in FY 06. Due to the long term nature of biological control, it may not be cost effective to do extensive monitoring every year.

In FY 06 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 06 Biological Monitoring**

Site	Bio Agent	Target Species	Photo Points	Stem Counts	Ocular Assessments	Net Sweep
Cave Gulch/Coxey Gulch	Mecinus janthinus	DT			Yes	Reduction on plant size, vigor, and stems/acre
Lincoln/Snow Talon	Mecinus janthinus	CT	Yes	Yes	Yes	Establishment
Horse Gulch/Magpie	Apthona nigricutis/flava	LS			Yes	Minimal stems found/Feeding damage evident/Redistribution is ongoing
	Larinus minutus	SK				
Walker Gulch	Apthona nigricutis/flava	LS			Yes	Feeding damage evident, Redistribution is ongoing

Site	Bio Agent	Target Species	Photo Points	Stem Counts	Ocular Assessments	Net Sweep
Whites Gulch, Indian creek, Cabin Gulch	Cyphocleonus achates	SK			Yes	Feeding damage evident, Roots infested – insectary nearly free of knapweed
Aldrich Gulch	Mecinus janthinus	DT & CT			Yes	Minimal 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, below, 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 06 Herbicide Effectiveness Monitoring**

Site	Target Species	Method/Observations
Cabin Gulch	Knapweed, thistles, hounds-tongue	Several new patches of weeds were located
Atlanta Creek	Common tansy, thistle	Monitored off road treatment and mapping
Wagner Snedaker	Thistles	Weed survey
Whites Gulch	Knapweed, thistles, hounds-tongue	Whites Drainage, Parks Gulch, and Whites Pass weed survey. Inventoried the entire area, 200 acres, contract sprayed in 2004. In July Of 2005 less than 1% surviving knapweed and approximately 5% surviving thistles. Planning for contract in fall of 2006.

Site	Target Species	Method/Observations
Magpie, Hunters Gulch, Carpenter 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. Follow up treatment in 2006
Bar Gulch	Knapweed, Canada thistle, musk thistle, toadflax	Ocular estimates were gathered in 2006. Planning surveys were conducted in preparation for a fall aerial contract. Preliminary effectiveness monitoring of fall aerial contract indicates treatment is affecting target species, while non-target species display no immediate effects. Buffers were placed to the north of the Magpie road and water quality monitoring was in place at the time of application.
Magpie obliteration project	Knapweed, Canada thistle, musk thistle, toadflax	Effectiveness monitoring displayed 90% or better effectiveness.
Hellgate	Knapweed/thistles	Checked permanent plots est. in 2002 to monitor effectiveness – treated area represents 90% weed free.
Duck Creek to Atlanta Creek, Camas Creek, Confederate, Vermont, Long Gulch, and Skidoo Gulch	Knapweed, Canada thistle, musk thistle, toadflax, and wormwood	Planning survey, treatment through contract spraying in the fall.
Upper Hellgate	Hounds-tongue, thistle	Planning survey and effectiveness survey – Area needs retreatment, hounds-tongue coming back.
Roadside: D1	Toadflax, spurge, hawkweed, common tansy, hounds-tongue, 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.
Sheps Gulch	knapweed, thistle, hounds-tongue	Effectiveness monitoring on contracted non-motorized spray project. Treatment was very effective with no non-target species damage. Effectiveness was estimated at the 95% range, but the entire area was not treated approximately 35 acres need treatment.
Elkhorns –non-motorized trails – Horsethief park and Longfellow Park	Toadflax, knapweed, thistle, hounds-tongue	Effectiveness monitoring on contracted non-motorized spray project. Treatment was very effective with no non-target species damage. Effectiveness was estimated at the 95% range and no live target species were observed.
Elkhorn Mtn. Range Crystal Creek	Tall buttercup (New Invader)	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.
Cave Gulch Fire Area	Dalmatian toadflax, leafy spurge, knapweed.	Twenty herbicide effectiveness plots have been read since 2001. Ocular estimates were gathered in 2006. Planning surveys were conducted in preparation for a fall aerial contract. Pre and post fire evaluations collecting photo points, stem densities, rooted frequencies, canopy coverage and GPS locations are

Site	Target Species	Method/Observations
		documented. To date, treatments display a range of 70 to 90% control. Preliminary effectiveness monitoring of fall aerial contract indicates treatment is affecting target species, while non-target species display no immediate effects. Sensitive plant locations were buffered and herbicide drift and water quality monitoring was in place at the time of application.
Jimtown Fire Area	Dalmatian toadflax, leafy spurge, knapweed.	Herbicide effectiveness plots have been read since 2001. Ocular estimates were gathered in 2006. Planning surveys were conducted in preparation for a fall aerial contract. 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. Preliminary effectiveness monitoring of fall aerial contract indicates treatment is affecting target species, while non-target species display no immediate effects. Buffers were placed around water seeps and the Jimtown Road at the time of application.
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 monitoring will continue to be monitored. Areas of infestations have continually grown. Level of treatment does not meet or exceed annual spreading rate.
Divide Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed (New Invader)	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. 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, determining treatment priorities for the coming years. Areas of infestations have continually grown. Level of treatment doesn't meet or exceed 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 are conducted to determine effectiveness and to plan/prioritize treatment areas for coming years is on going. Roadside treatment is the number one priority of treatment. Effectiveness of treatments is very high.
Marsh Creek	Thistle	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Area of infestation has been reduced over the past few years. A 50% decline in acres treated have resulted from continuous monitoring and spot treatment.
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. Control and monitoring under sale plan dollars continues evident by a reduction in acres treated from year to year.

Site	Target Species	Method/Observations
Alice Creek	Yellow toadflax, St. Johnswort	Photo points established and ocular observations were made to monitor infestation size and effectiveness of treatment. Infestation has remained stable over the past two years. No St. Johnswort plants were observed in the fall of 2006. This is one year after initial treatment.
Patterson Prairie	Spotted knapweed	Ocular estimates of infestation canopy cover and site description noted. Monitoring in 2006 indicates a 70% reduction in area treated from the previous years.
Road right-of-ways, Ogden, Dalton, Copper Creek	Knapweed, Hounds-tongue, Yellow toadflax	Ocular observations to determine herbicide effectiveness and planning to prioritize treatment areas indicate reductions ranging from 55% – 78% in land treated. There is a direct correlation between levels of effectiveness and species treated.
Lincoln Trail heads & Campgrounds	Spotted knapweed	Ocular observations, Determine application needs and signing. Trail heads on the district have a low level of weed infestations and are remaining stable under approximately 50% herbicide treatment effectiveness.
Aspen Grove Campground	Spotted knapweed	Ocular, general site condition and infestation size and canopy cover noted. Herbicide effectiveness has decreased the size of infestation by 50%.

Table 3, below, 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)
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.

Ranger District	Project Area	Plot Type	Comments
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.

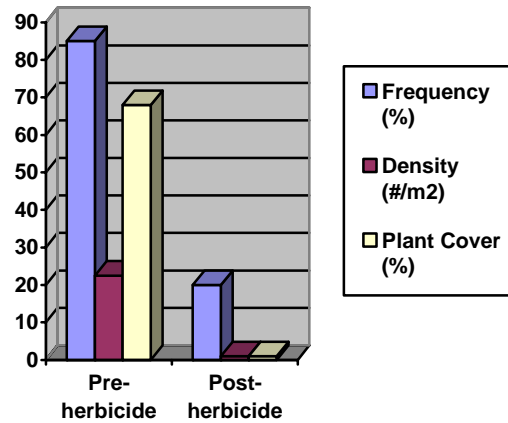
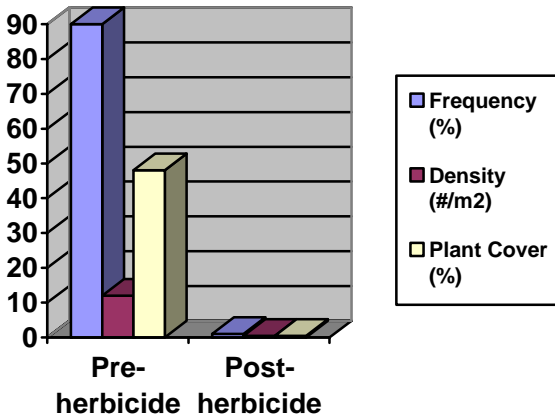
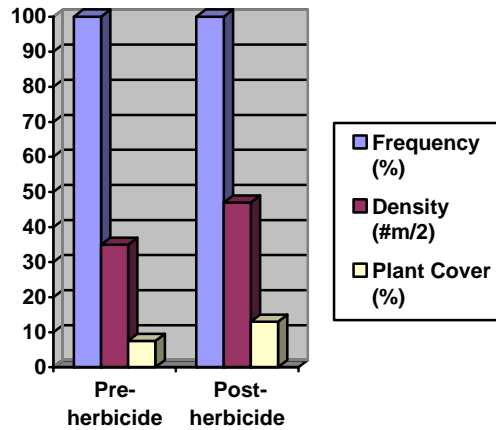
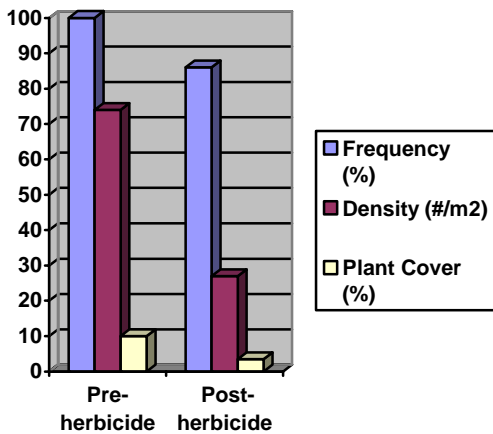
Biological control was elevated significantly in 2001, releasing approximately 1 million insects each year until 2004. Insect populations have been recorded as having the physical capability to survive harsher climatic conditions on most of the release sites. Higher than expected survival rates appear 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, Magpie Drainage.	RMRS Bozeman	Releases made and monitoring established. Monitoring has been done years 2002- 2006
Dr. Sharlene Sing, and Jennifer Birdsall	Herbicide effectiveness macroplots in the Cave Gulch fire area. Paired Plots located in Magpie 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.

*Actions in response to variability assessment:*

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.

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' centered 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.

**Table 5—Total FY06 Helena National Forest Direct Weed Control (Acres)**

Control Type	D1	D2	D4	Total
Herbicides (Acres)	1479	3595.5	2200	7274.5
Biological Agents (acres)	350	550	20	920
Pulling (Acres)	1.1	2	1	4.1
Revegetation (seeding acres)				
Cultural (mowing / irrigation)	1	3	1	5
TOTAL	1831.1	4150.5	2222	8203.6

**Table 6-- FY 06 Herbicide Treatment By Fund Code (Acres)**

Fund Code	D1	D2	D4	Total
CWKV - KV	129		132	361
CWKV-KV-CONTRACT	398			398
NFWW – Weed Mgt.	166	896	734	1796
NFWW-NW-CONTRACT GROUND			300	300
CWK2	258	802.5	464	1524.5
CWK2-COOP	248	83	468	799
CWK2-CONTRACT GROUND		144		144
CWK2-CONTRACT AERIAL	280	1370		1650
RAC – Resource Advisory Committee		300	2	302
STEWARDSHIP				
Administrative Site		9	5	14
TOTAL	1479	3595.5	2200	7274.5

**Table 7 – FY 06 Herbicides Used**

Herbicide	Registration#	Lbs/Ai	Acres	Ranger District	Application Method
2,4-D	228-145	180	180	HNF	Ground
	01381-00103				
	71368-1				
	34704-120				
	5905-501				
PICLORAM	62719-6	1275	5200	HNF	Ground
PICLORAM	62719-6	412.5	1650	HNF	Aerial
IMAZAPIC	241-365				
CLOPYRALID	62719-259	0.8	3	HNF	Ground
METSULFURON METHYL	352-439	2.5	40	HNF	Ground
CLOPYRALID/2,4-D (CURTAIL)	62719-48				
CHLORSULFURON	352-522	18.7	299.5	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 **46,000 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 184 releases @ 5 acres/release for a total of **920 acres** treated with biological management agents.

**Table 8 – FY 06 Biological Management Agent Release**

Ranger District	Biological Agent	Total # Released	# of Releases @ 250 Released	Target Species	
Townsend	Cyphocleonus achates	1600	6	SK	
Helena	Cyphocleonus achates	Approximately 40,000(Redistribution efforts underway)	156	LS	
	Apthona lacertosa			LS	
	Apthonia flava			LS	
Townsend & Helena & Lincoln	Obera erythrocephala		5000	20	DT
	Mecinus janthinus		1000	4	DT
	Brachypterolus pulicarius				SJ
	Aplocera plagiapa				SJ
	Chrysolina spp				SJ
	Ceutorhynchus.litura				CT
	Urophora.cardui			CT	

Ranger District	Biological Agent	Total # Released	# of Releases @ 250 Released	Target Species
	Cyphocleonus achates Mecinus janthinus Chrysolina spp. Rhynocillus conicus			CT SK DT SJ
Total acres treated by bio agents 920				

Manual Treatment

**Pulling occurred on approximately 5 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 9 below provides details on this activity.

**Table 9 – FY 06 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
Helena	1	Knapweed, Perennial pepper weed, Dalmatian toadflax were pulled at various times on administrative sites to eliminate non-target mortality.
Helena	2	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	5	

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 06 Cultural Weed Control**

District	Acres Treated	Site And Treatment
Townsend	Few Plants	Musk thistle cut on the top of the divide between Avalanche and Whites gulch.
Helena	1	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	1	

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 06 Education Presentations**

<b>Date</b>	<b>Teacher</b>	<b>School</b>	<b># of Presentations</b>	<b># of Students</b>
May 06	Diane Johnson	RMRS – Rocky Mtn. Research Station for Bio-Control	1	20
May 06	Jay Winfield, Phil Walsh, Jim Nelson	Dearborn WMA	2	40
May 06	Diane Johnson, Tracy Schilling, Jay Winfield, Phil Walsh, Jim Nelson, Wes Simpson, and Misty Hamilton	Winston WMA	2	20
May 06	Shawn Heinert	Lincoln school district	6	65
June 06	Shawn Heinert	Patterson Prarie WMA	1	10
June 06	Phil Walsh, Jim Nelson, Jay Winfield	Dearborn WMA	1	18
June 06	Jay Winfield	Last Chance BCH	2	16
June 06	Jay Winfield	Last Chance BCH	1	6
July 06	Wes Simpson, Phil Walsh, Vicky Maclean, Jim Nelson, Misty Hamilton	Lewis and Clark Co. Fair Booth	8	120

**Recommended Efforts:**

Continue an aggressive approach in noxious weed management under the 2006 Noxious Weed EIS and prepare and release the second Record of Decision authorizing treatment in the Grizzly Bear Recovery Zone.

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 (1996 through 2006). 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	Monitoring: Monitored annually by permittee  Improvements: all improvements have been reconstructed and some

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		Improvements: reconstruct 4 water developments	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 process, key areas have been established Improvements: reconstruct 4 water developments	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 Improvements: 2 improvements have been reconstructed Likely to not have decreased condition due to the reduction, proper utilization and improvement construction.
SPRING CREEK	19-Dec-96	9% increase in numbers <u>Vegetation:</u> key areas have been established <u>Hydrology:</u> establish long term cross sections in representative riparian areas Improvements: reconstruct 5 water developments, 6 new water developments to construct, reconstruct 4 fences	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. Improvements: 5 improvements have been reconstructed and 2 new developments have been constructed, 4 fences have been relocated or reconstructed. Likely to not have decreased condition

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
			as shown by cross sections and improvement construction.
WATSON	19-Dec-96	5% increase in season Improve riparian and upland conditions and distribution <u>Vegetation:</u> key areas have been established <u>Hydrology:</u> establish long term cross sections in representative riparian areas. Vermont Creek has been fenced and is used as a holding pasture. Improvements: reconstruct 4 water developments, reconstruct 2 fences	Monitoring: Monitored annually by permittee 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. 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. Likely to not have decreased condition as shown by cross sections and improvement construction.
SNEDAKER BASIN	19-Dec-96	Combined with Wagner allotment in 1996	
WAGNER SNEDAKER	19-Dec-96	20% reduction in permitted numbers and 15 days in season <u>Vegetation:</u> key areas have been established <u>Hydrology:</u> establish long term cross sections in representative riparian areas No improvements are planned for this allotment.	Riparian cross sections reread in; Trout Creek – 1997, 1998 Conditions were the same, utilization by the sheep was excessive. Improvements: 2 water developments have been reconstructed that were not identified in the AMP Likely to not have decreased condition as shown by cross sections; also reduction in numbers and improvement construction.
KEENE	19-Dec-96	Approximately 20% decrease in numbers and season because Private land is not included in the stocking rate. No improvements are planned for this allotment because improvements are on private land.	Likely to not have decreased condition due to reduction.
POORMAN/WILLOW	27-Aug-97	The AMP decreased the grazing season and head months <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. <u>Hydrology:</u> Three short term	Average upland utilization was 30%, standards were met, 6" stubble height and 12% bank disturbance, 10% riparian use  Improvements: 1.5 of fence and cattleguard has constructed



Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		(implementation) monitoring plots were established to monitor riparian area utilization, stubble height and bank alteration to meet the requirements of the Infish Biological Opinion. Improvements: reconstruct 1 water development, reconstruct 1.5 miles of fence and 1 cattleguard	Likely to not have decreased condition due to the reduction, proper utilization and improvement construction.
STEMPLE SOUTH POORMAN	27-Aug-97	Combined with Poorman/Willow,	Poorman drainage was removed from the allotment due to fisheries concerns. No decrease in allotment conditions
NORTH BEAVER	18-Jun-98	Increase in the season of use 5 days Improve riparian and upland conditions and distribution <u>Vegetation:</u> key areas have been established <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. Improvements: reconstruct 1 water development, reconstruct 2 fences	ECODATA plots have been re-read or re-photographed in 2004-2005 due to ERG study for the Elkhorns, Average utilization was 23%, standards were met, permittees did ocular estimates of elk use prior to livestock entering the forest. Improvements: Water developments and fences have been reconstructed and 2 new developments have been constructed Likely to not have decreased condition due to proper utilization and improvement construction.
EAST PACIFIC	18-Jun-98	No change in stocking rate or season of use Improve riparian and upland conditions and distribution <u>Vegetation:</u> key areas have been established <u>Wildlife:</u> Measure utilization levels on core winter range areas to insure 3" forage base. <u>Hydrology:</u> establish long term cross sections in representative riparian areas Improvements: reconstruct 8 water development, reconstruct 4 fences, one private boundary	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 Riparian cross sections reread in; Lower Weasel Creek – 1998 Upper Weasel Creek – 1999 These transects have only been read once so a comparison is not available. Wildlife utilization was monitored with the ERG study prior to livestock entering the forest. Improvements: 6 water developments have been reconstructed and 2 fences have been constructed using electric fence. 2 fences were reconstructed in 2001. Likely to not have decreased condition due to proper utilization and improvement construction.

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
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>Improvements: reconstruct 4 water development, reconstruct 1 fence if monitoring indicates the need</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 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: 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.</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
WHITEHORSE	18-Jun-98	<p>No change in stocking rate or season of use</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><u>Wildlife:</u> Measure utilization levels on core winter range areas to insure 3" forage base.</p> <p>Improvements: reconstruct 4 water development, reconstruct 1 fence</p>	<p>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;</p> <p>Kimber Creek – 1999, 2003</p> <p>Carex and redtop are more established on the bank, trapping sediment. The greenline is getting wider because livestock impacts have been minimized.</p> <p>Wildlife utilization was monitored with the ERG study prior to livestock entering the forest.</p> <p>Improvements: 4 water developments have been reconstructed and all interior fences were reconstructed with a grant in 2001.</p> <p>Likely to not have decreased condition due to proper utilization and improvement construction.</p>
TIZER	18-Jun-98	No active grazing	No decrease in allotment conditions
MCCLELLAN	18-Jun-98	<p>11% reduction</p> <p><u>Hydrology:</u> establish long term cross sections in representative riparian areas.</p>	<p>Riparian cross sections reread in; Corral Creek – 98, 00</p> <p>Some improvement in vegetation composition. Bare areas are beginning</p>

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
		<u>Vegetation:</u> key areas have been established	to fill in with vegetation. Lots of use by 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	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 transects have 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 condition due to proper utilization and improvement construction.
JIMBALL	23-Jun-98	Improve riparian conditions <u>Vegetation:</u> key areas have been established	Average utilization was 60%, standards were exceeded Riparian utilization on Pikes Gulch was 15%, 10% Streambank disturbance Pikes Gulch removed from pasture and used only as a trailing pasture. Improvements: 4 water developments have been reconstructed Possible decrease in condition due to overuse.

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
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	15% reduction <u>Vegetation:</u> key areas have been established	Average utilization was 35%, standards were met Improvements: 5 water developments have been constructed or reconstructed Likely to not have decreased condition due to reduction, proper utilization and improvement construction.
MOORS MOUNTAIN	23-Jun-98	Improve riparian conditions	Due to riding requirements in the plan, this pasture/allotment has not been grazed for two consecutive years 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. Likely to not have decreased condition due to rest and improvement construction.
YORK HILLS	23-Jun-98	Combined with Nelson-Favorite to provide opportunities considering a rotation of both spring and fall grazing based on plant characteristics and water availability.	See Nelson-Favorite
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	Improve riparian conditions <u>Vegetation:</u> key areas have been established	Average utilization was 45%, standards were met Riparian utilization on Pikes Gulch was 30%, 10% Streambank disturbance and 25% on Indian Creek, 10% Streambank disturbance Improvements: 1 fence has been reconstructed Likely to not have decreased condition due to proper utilization and improvement construction.
GROUSE RIDGE	23-Jun-98	Improve riparian conditions <u>Vegetation:</u> key areas have been established	Average utilization was 25%, standards were met Riparian utilization on Bowman was 30%, 10% Streambank disturbance and 25% on Fantail Creek, 10%

Allotment Name	NEPA Decision Date	Action Taken in Plan Update	Monitoring, Results and/or Actions Taken since Plan update
			streambank disturbance and 20% on Trout Creek, 10% Streambank disturbance Improvements: 1 fence and 1 water development has been reconstructed Likely to not have decreased condition due to proper utilization and improvement construction.
CELLAR-OGILIVIE	22-Sep-98	Approximately 20% reduction in season and/or numbers  <u>Vegetation:</u> key areas have been established Improvements: a drift fence was built in 2002 to keep cattle drifting northward from this allotment into the Marsh Creek allotment.	Average utilization was 35%, standards were met Improvements: 1 fence constructed  Likely to not have decreased condition due to reduction, proper 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 second phase of this work was completed in 2006. The study entitled "Elkhorns

Vegetation Study, Phase 2" can be found in the project file. The results of the study showed that the allotment conditions in the North Crow and Kimber allotments are very good to excellent.

*Analysis:*

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-six 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-five 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-six allotments presented here, thirty-five 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 1996 to 2006.

Treatment Year	Acres of Conifer Encroachment Treated			
	Townsend	Helena	Lincoln	Total Forest
1996	1187	unknown	2061	3248
1997	448	548	500	1496
1998	1443	814	412	2669
1999	950	541	105	1596
2000	623	35	0	650
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
2006	100	1651	2025	3776
1996-2006	9788	6543	8852	25,183 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:*

25,183 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. 25,183 acres of conifer encroachment treatment, shown in the above table, equals 24% 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 rather than open grassland, approximately 12% 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 likely 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</b>	<b>Action Taken</b>	<b>Remarks:</b>
Blossburg	Streambank Trampling	Adaptive management	Action not taken because FS have 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, exclosures
Cellar Ogilvie		2nd year of suspension for 2004 grazing season	Permittee is doing better this year with regards to the area of concern
Tarhead 1 permittee	Permit Requirements	Notice of Non-Compliance	Permit Waived back to 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

Allotment Name	Compliance Issue	Action Taken	Remarks:
			numbers were for 22 pair instead of 44 (original). The spring of 2006, they waived the permit back to the FS.
South Crow 5 permittees 4 YES 1 NO	Terms & conditions of permit for improvements	Notice of non-compliance	Improvement responsibilities assigned to all permittees proportionate to permit numbers in 2004. 1 permittee did not complete maintenance/reconstruction on improvements responsible for. Improvements have to be completed by June 1, 2007.

*Data Analysis Methods:*

For 2006 there were six 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. 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).

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 are 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. Eight 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 2006 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 fewer 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.

## **(E) Regulated Volume, Timber**

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### **(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 FY06 offer was primarily sawlog volume associated with the Snow Talon Fire Salvage Timber Sale and the Jimtown Fuels project. Snow Talon Salvage sale offering was in response to a large scale wildfire and was added to and prioritized within our 5 year plan in FY04. Jimtown Fuels was identified as part of the Forest base harvest schedule and projected to be offered for sell in FY01 however offered was delayed due to project litigation. The Helena Forest requested a volume target commensurate with expected output for FY06, however; due to deterioration of material prior to sell, volume estimates were below initial field reconnaissance estimates.

#### *Monitoring Results:*

Timber sale program statistics indicate that in FY06, the Helena National Forest offered 7.4 MMBF (7.4 MMBF roaded, 0.0 MMBF inventoried roadless) of an 8.4 MMBF financed program, which included a combination of personal use firewood, post and pole, and commercial sawlog sales.

The past 5-year average accomplishment for the Helena National Forest is 8.0 MMBF of a 15.5 MMBF financed program.

## 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.

*Monitoring Results:*

Item 1 and 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. In FY06 the Helena offered 2 timber sales, one on the Lincoln district and one on the Helena district. The sale specific FY06 analysis for Snow Talon Fire Salvage on the Lincoln district and Jimtown Fuels on the Helena district are discussed in detail for this report.

*Snow Talon Fire Salvage – Lincoln Ranger District*

Volumes offered for Snow Talon Fire Salvage in FY06 had a board foot/cubic foot ratio of 2.02/1.0 and an average volume/acre of 5.5 MBF.

*Jimtown Fuels – Helena Ranger District*

Volumes offered for Jimtown Fuels in FY06 had a board foot/cubic foot ratio of 2.36/1.0 and an average volume/acre of 2.55 MBF.

The past five year average on the Helena National Forest for board foot/cubic foot ratio is 2.06/1.0 and the average volume/acre harvested is 5.1 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 Snow Talon Fire Salvage and Jimtown Fuels were planned for 100% tractor. Logging systems for FY06 are within the acceptable variability limits. Logging methods used over the last 5 years have been distributed between tractor (55%), cable (19%) and helicopter (26%). This deviation in distribution from Forest Plan recommendations reflects the Forest priority to treat all suitable lands within fire perimeters.

**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 the past five years the Forest Plan projected 9,700 acres of harvest. In the past five years the Forest has harvested 3,401 acres. Just as the regulated volume prepared for sale is not a target, the projected acres harvested are not a target, but a ceiling. Deviations below Forest Plan projections are acceptable.

*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 2006, a regional reforestation review was performed for multiple sales (project file). In addition, implementation monitoring was done by the Silviculturist in 2006 for the Snow Talon and Greyson Bugs timber sales, and an inter-agency BMP audit was conducted for Cave Gulch Salvage. See the project file for these documents. Also, see the file for example prescriptions and other sale monitoring documents for projects implemented during the 5 year planning timeframe, 2002-2006. 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 2006. In 2006, harvest projects occurred in Snow Talon Salvage and Greyson Bugs Salvage timber sales. 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 2006 harvest prescriptions being implemented included Greyson Bugs timber sale and Snow Talon Salvage. During the 5-year planning timeframe, additional sales reflected include Baldy 8, Granite Whitebark, Poorman, Wagner Atlanta, Cave Gulch Fire Salvage, and Grassy Bugs Salvage. Assumptions in the Forest plan are continually assessed for validity when compared to silvicultural prescriptions and post-treatment monitoring. 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.

#### *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, Greyson Bugs 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 2006.

**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:*

Regional Forester approval was granted for openings greater than 40 acres in Clancy Unionville, Nevada Dalton, and North Elkhorns, which were planned during the 5-year period but not implemented (example project file). In 2006, two units (74 and 51 acres) were done with a seed-tree prescription in the Snow

Talon salvage sale. Several other projects that were implemented in the monitoring period (2002-2006) had opening sizes over 40 acres (Maudlow-Toston, Cave Gulch, Snow Talon; 18 units total with a variety of prescriptions – see FACTS query in project file). All of these projects occurred in wildfire areas, and fit into the exception above not requiring 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.

The other sales in the 5-year monitoring period were Baldy 8, Granite Whitebark, Poorman, Beaver Dry, Cave Gulch Salvage, Wagner Atlanta, Grassy Bugs Salvage, Lincoln Compound, Black Butte Salvage, and Greyson Bugs Salvage. Units or portions of projects that occurred prior to 2002 are not included. 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 2006. 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. Since the fires of 2000, over 17,000 acres have had stocking surveys accomplished. In 2006, 6,153 acres were surveyed; of this, about 1% (59 acres) were found to be failing. Of these failing stands, 27 acres were in areas that had not been logged, but were burned by wildfire and natural regeneration was desired. The remaining 32 acres of regeneration failure are in units that were logged (Maudlow-Toston salvage and Wagner-Atlanta) where the original reforestation expectations of the prescription were not met. For all failures, planting is being programmed to remedy the failures.

**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 2006 due to the transition to FACTS so are not available for analysis for this monitoring period.

Planting usually occurs in the first two years after completion of harvest. In 2006, 478 acres were planted in harvest units (80% of the projected 600 acres per year). An additional 228 acres were planted in fire areas. Over the 5 year planning timeframe, from 2002 through 2006, 1,787 acres were planted in harvest areas averaging to 357 acres per year or 60% of the projected acres in the Forest Plan. With the addition of planting in fire only areas, the totals amount to 2,323 since 2002, averaging 465 acres per year.

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 2006, stands harvested in 2002 were reviewed. Of the harvested areas, 58 acres were planted and 76% of this is certified as stocked and the remaining 24% are progressing. An additional 260 acres of harvest were prescribed for natural regeneration in 2006; of these, 49% are certified and 47% are progressing; the remaining 4% are failing with additional reforestation treatments prescribed. These results are indicative of sites where natural seedlings are successful but take a few years to grow to prescription specifications. Planting which has occurred after 2002 is not expected to be certified as of this monitoring report; all of the stands listed as progressing are scheduled for the appropriate stocking surveys. An additional 63 acres was planted in 2002 outside of harvest areas; 43% of this acreage is currently 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. According to the FACTS, from 2001 to 2006 3,072 acres in both harvested and non-harvested (fire) areas were planned for planting, and 2,862 of these were accomplished (93%). Of this planting, about 1,892 were planned in harvested areas and 1,865 acres of those accomplished (99%). In 2006, 100% of the harvested areas planned for planting were accomplished (478 acres). These plantings occurred in the Beaver Dry, Copper Snowbank, Cave Gulch Fire Salvage, Maudlow Toston Salvage, and Poorman harvest areas. Including fire areas, 789 acres were planned in 2006 with 706 accomplished (90%).

#### 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 does not meet the variability requirement of planting 75% of the projected average 600 acres per year over the 5 year timeframe when only planting in harvested units is considered (from 2002 to 2006, 60%). The Forest meets the variability requirement of planting at least 50% of the projected acreage per year; in 2006 80% was accomplished in harvested areas alone. The acreage and target increases when non-harvested that were planting are considered (78% over the 5-year timeframe, 118% in FY 2006). This increase was in response to the large wildfires and subsequent salvage activity that occurred in 2000 and 2003.

Accomplished planting is within 10% of planned planting over the 5 year monitoring timeframe. From 2001 to 2006, 99% of planned plantings in harvested areas were accomplished. In 2006, 100% of planned plantings in harvest areas were accomplished. When non-harvested units are considered, the accomplishment percentage over the 5-year timeframe falls to 93%, which is still within the range of variability.

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.

The Forest Plan projects 1,940 acres of harvest yearly and 600 acres of planting, thereby assuming that about 31% of harvest areas require planting with the remaining 69% being natural regeneration or no reforestation needed. According to the Forest Plan EIS, planting is scheduled for about 1/2 of the clearcut acres each year, and other regeneration systems such as shelterwood and seed-tree will generally naturally regenerate (II/74). Currently, from 2002-2006, the Forest harvested approximately 670 acres/year (FACTS query project file), and 357 acres of planting (53%). The relative abundance of planting to harvest exceeds what was projected in the Forest Plan, although the level of acres is lower. This demonstrates the commitment of the Forest to meet the intent of this standard, which is to provide for adequate stocking within a reasonable timeframe following harvest.

*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:*

In the past 5 years the Forest has not accomplished any pre-commercial thinning. Non-commercial projects have occurred on the Forest in the form of fuels slashing and treatments, which in some cases accomplish similar objectives although often do not occur in past harvest units. Like planting, TSI projects are dependant on the accomplishment of harvest activities, funding, and the types of prescriptions used although the timeframe from initial harvest to the pre-commercial thinning is much longer. Unlike planting, TSI projects are dependant upon the quantity and type of harvest units that occurred farther in the past and therefore are more subject to changing management policies and funding.

The projected 280 acres of pre-commercial thinning annually reflects 14% of the annual projected timber harvest acres (1,940). If the same percentage were applied to the average annual harvest acres during this 5-year monitoring period (2002-2006, approximately 720 acres) the relative TSI target would be about 100 acres to meet the intent, if not the value, of the Forest Plan element.

The FACTS query showed areas scheduled to be thinned during this monitoring period; this amount (1,301 over 5 years) would average to 260 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 2006 due to a lack of funding and changing management policies concerning lynx habitat. Over the 5 year timeframe no pre-commercial thinning has been accomplished in the FACTS database although 1,301 acres were planned in accordance with silvicultural prescriptions.

**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:*

Evaluate the accuracy of suitable timberlands classification using the timber planning process, stand exams and environmental analyses. 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 2006, this included a Regional reforestation review of several past timber sales (see project file). 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 Forest Plan amendments, specifically, Amendment #'s 5, 8, 9 and 18, and environmental documents 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 2006 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 and none in 2006). During the 5 year monitoring period, 1,158 acres of unsuitable lands have been harvested with a variety of prescriptions (the bulk being fire salvage-related). 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.

Exams in burned areas have determined that given the difficulty in re-stocking (due primarily to site harshness), about 565 acres to date are prescribed for "natural recovery" in suitable lands (FACTS query project file). Natural recovery is a reforestation option that allows long-term natural stocking, and the stand is not expected to produce a timber product for at least the next rotation. The inability to assure re-stocking is a critical element of land suitability; therefore, these lands should not be considered in the suitable base. Exams in fire areas are ongoing and there is potential to add to these natural recovery areas in lands currently designated as suitable. Examinations for all stands can be found in the stand folders.

FACTS was also queried to show stands listed as reforestation failures. The results show 334 acres failing in the suitable timber base, and 51 acres in unsuitable areas. Some failing stands are located in the Maudlow-Toston salvage sale (66 acres) and one in the Wagner-Atlanta sale (21 acres); all of these are scheduled for planting. The remaining 298 acres of failures are from older, historic sales or in unmanaged lands. A reforestation strategy is in place for these failures; some may be candidates to be removed from the suitable timber base due to the inability to assure stocking. See the project file for a draft, internal document describing the reforestation assessment strategy.

#### 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 periods 2005, 2006, and for the overall 5 year period since 2002. 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 other changes have occurred during this monitoring period, thereby meeting the variability standard of + or - 5% change in acreage.

Assessments of failures and natural recovery stands since the fires of 2000 thus far indicate less than 1000 acres potentially in need of allocation changes; this is still within variability and may occur in the future.

##### *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.

## **(F) Soil and Water**

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### **(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 an 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 hely-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 2006 monitored eleven different streams on the forest for temperature, pH, dissolved oxygen, conductivity, and macroinvertebrates. In addition, channel cross sections, pebble counts, sinuosity and slope were measured. Stream core samples were obtained at an additional site.

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.

The water quality monitoring station at Copper Creek was continued in order to monitor the Snow Talon Salvage sale. Flow measurement, temperature, suspended sediment samples and bedload were collected for both sites. An automatic stage recorder and ISCO sediment sampler were also operated at this site.

In anticipation of the Cabin Gulch project the water quality station at Cabin Gulch was reinstated. Discharge, suspended sediment and bedload were collected at this site during the rise and fall of the hydrograph.

*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 program had several observations and recommendations which were brought forward: (1) Sulphur Bar Creek, which was burned in the Toston Fire of 2000, and last monitored in 2003, had sensitive macroinvertebrates thriving in its waters, vegetation was growing back, the elk exclosure had thick aspen stands, all signs of a vulnerable ecosystem recovering. More sensitive mayflies and caddisflies increased in the study sample while less sensitive aquatic worms decreased between 2004 and 2006. (2) Magpie Creek, which had been intensely burned in the 2000 Cave Gulch Burn had a history of high silt levels and off-road recreational impact. In 2006 water chemistry levels were within range and stable. Dissolved oxygen increased from 7.43ppm to 8.4ppm between 2005 and 2006 in response to increased vegetation growth and shading. The primary problem in Magpie Gulch still are the ATV tracks that cut through the stream and erode the banks, despite signage in the area prohibiting off-trail riding. Increased patrolling of the area might address this problem. (3) Confederate Gulch was not a site visited by the Helena Stream Team, but observed on the way to another site. It is a private claim that is currently undergoing small-scale and internet-advertised mining. The stream bank has been diverted to allow for a dredge process of mining. Upon further research, the team learned that even private claims must follow state water quality regulations. Students recommend setting up transects on stretches of the stream both above and below the mining operation. The location of these transects will be on the adjacent Forest Service lands. (4) YFMP stream monitoring in 2007 should include sites on the Ten Mile Watershed, Helena's primary watershed source.

For the Lincoln crew, a brief test of macroinvertebrates on the study stretch of the Blackfoot located below the dam indicated that only 3 individuals were collected in over 60 minutes of searching, an indicator of poor water quality. Snowbank Creek was monitored for fish spawning habitat. Previous years' data was available through the Lincoln District fisheries biologist. The friedel index, a measure of the pore size and relative permeability of the stream bed layer, increased from 3.5 to 5 between 2003 and 2006. A score of 4 is acceptable.

The sediment analysis, for the Toston/Maudlow salvage sale indicated that the amount of total sediment was similar to what it was in the previous two years indicating that the high sediment levels from the fire are probably at or approaching a background level. As seen by the Youth Forest Monitoring program Sulphur Bar showed overall improvements and effects from the salvage logging appear to be negligible.

Monitoring on Magpie Creek also demonstrated that the amount of sediment per unit of discharge was significantly less than what it was in 2005. While there are still some effects from the fire the effects from the salvage logging appear to be negligible.

Cabin Gulch showed sediment samples that were within range of what had been previously measured there. Due to the subterranean flow in this area flows never got above 4 cfs and there was very little correlation between flow and sediment.

Copper Creek showed relatively large amounts of sediment coming from the burned landscape compared to 2005. 2006 exhibited more what you would expect from a burned landscape than what was seen in 2005. 2006 was a much wetter year with 21,400 acre-feet of water coming off between April 19<sup>th</sup> and October 18<sup>th</sup> vs 15,600 acre-feet of water in 2005. Peak flows in 2006 were 222 cfs vs 131 cfs in 2005. Any effects due to logging are masked by the range of variability between the two years.

**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. See above analysis for details.

*Actions in response to variability assessment:*

Within variability, no action is required.

**Recommended Efforts:**

Continue with Youth Forest monitoring efforts and the five 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:*

Two watershed improvement projects were monitored in 2006. Continuation of the Snowtalon jammer trail rehab and the North Belts Travel Plan road decommissioning.

*Data Analysis Methods:*

Both watershed restoration projects were completed.

*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 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:

##### *Annual Report Available:*

Yes

##### *Documentation of Monitoring Methodology for Activity 1*

Field soil conditions were judged using Howes' protocol for 6 qualitative disturbance classes. Data points were sampled in a randomly oriented, systematic grid pattern, with a sampling intensity of 10 points per acre. At each data point, presence or absence of visual indicators for soil compaction, rutting, displacement, severe burning, surface erosion, mass wasting, and ground cover was recorded, along with the disturbance class rating (Howes 2000).

Soil bulk density was measured using the standard core sample method (Blake and Hartge 1986). Soil infiltration rates were measured using the ring infiltrometer method (Bouwer 1986). To aid in describing spatial variability, triplicate bulk density cores were collected and triplicate infiltration tests measured for one sample point representing each of the following disturbance levels within the harvest unit: low, moderate and high disturbance (if present). For comparison, triplicate bulk density cores and triplicate infiltration tests were also sampled from one undisturbed sample point in an adjacent, unmanaged area with similar soils.

### *FY06 Monitoring Activity 1:*

Forest soil science personnel conducted field assessments of soil conditions in four Timber Sale Areas harvested within the past 1 to 5 years. Areas sampled included a total of six harvest units in the Poorman (2 units), Snow Talon (1 unit), Grassy Bugs (1 unit) and Greyson (2 units) Timber Sale Areas. Soil samples from harvested areas 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 post-harvest soil conditions, and to evaluate effectiveness of soil-related Best Management Practices (BMPs).

#### *FY06 Analysis 1:*

The full report documenting the findings of these field reviews conducted during summer and fall 2006 is on file at the Helena National Forest Supervisor's Office. This full report includes documentation of the monitoring methodology, data collected, and results of the monitoring data analysis. Key conclusions are recounted below in the "FY06 Within Forest Plan Variability" summary.

### *Documentation of Monitoring Methodology for Activity 2*

Two points were randomly selected for locating the area of post-treatment field evaluation within Unit 1 of the Deep Creek Fuels Treatment Project. Each random point served as plot center for soil monitoring plots 06SF004 and 06SF005 (Figures 1 and 2). The randomly-selected center point for soil monitoring plot 06SF004 was located at the GPS coordinate: 488978 mE 5133601 mN. The randomly-selected center point for soil monitoring plot 06SF005 was located at the GPS coordinate: 489138 mE 5133336 mN.

At each soil monitoring plot, a total of 100 sample points were evaluated along 7 transects, with each transect being 75 feet in length. The 7 transects were oriented in a pre-defined hexagonal pattern, starting at the plot center point and directionally laid out according to the standard FIREMON sampling method (2005).

At each of the 100 sample points, both qualitative and quantitative data were recorded:

- For the qualitative assessment, visual indicators of severe soil burning and erosion (e.g. sheet, rill and gully erosion, and mass wasting) were documented.
- For the quantitative assessment, bare ground versus soil cover was recorded at each sample point, and hydraulic conductivity of the soil surface was measured using the mini-disk infiltrometer method for determining soil water repellency (Robichaud 2004).

### *FY06 Monitoring Activity 2:*

Forest soil science personnel conducted field assessments of post-treatment soil conditions at two sites within unit 1 of the Deep Creek Fuels Treatment Project during June 2006. Data from these field reviews serves as information to document post-treatment soil conditions, and to evaluate effectiveness of soil-related Best Management Practices (BMPs).

#### *FY06 Analysis 2:*

The full report documenting the findings of these field reviews is on file at the Helena National Forest Supervisor's Office. This full report includes documentation of the monitoring methodology, data collected, and results of the monitoring data analysis. Key conclusions are recounted below in the "FY06 Within Forest Plan Variability" summary.

### *FY06 Monitoring Activity 3:*

Forest soil science personnel conducted field assessments of soil conditions on primary range sites within the MacDonald Pass, Austin, Empire, Shingle Mill and Gould Creek Grazing Allotments. For analysis purposes, soil samples from grazed areas were compared to baseline information available in pertinent scientific literature, because there were no known un-grazed sites to provide site-specific baseline data for comparison. Data from these field reviews serves as information to document current soil conditions

on primary range sites, and to evaluate trends in rangeland health with ongoing grazing, which can provide a feedback loop for adaptive management in the future.

#### *FY06 Analysis 3:*

The full reports documenting the findings of these field reviews on primary range sites, conducted during summer 2006, are on file at the Helena National Forest Supervisor's Office. The full reports include documentation of the monitoring methodology, data collected, and results of the monitoring data analysis. An "FY06 Within Forest Plan Variability" assessment is not included with this report, because this range site data is intended for use as a baseline to evaluate variability in the future.

#### *Data Analysis Methods:*

Field data for soil infiltration tests and hydraulic conductivity measurements, as well as laboratory data from soil bulk density cores, was entered into Excel spreadsheets to calculate infiltration and hydraulic conductivity rates, as well as soil bulk density values. SPSS was used to conduct a One Way Analysis of Variance (ANOVA), comparing soil bulk density and soil infiltration means representing each soil disturbance class against mean values from an undisturbed site.

#### *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 within "activity areas" (i.e. timber harvest units, prescribed burn units, etc.). 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.

#### *FY06 Monitoring Activity 1*

For monitoring in six timber sale (TS) harvest units (e.g. Poorman TS units 8 and 15, Snow Talon TS unit 50, Grassy Bugs TS unit 1, and Greyson TS units 1 and 5), both the magnitude and extent of the following types of soil disturbance were evaluated in the field: compaction, rutting, displacement, severe burning, accelerated erosion, and mass wasting. The magnitude of soil compaction was also evaluated by analyzing soil bulk density samples in the laboratory collected from all six monitoring sites, and by field measurements of soil infiltration rates at the four monitoring sites in Snow Talon, Grassy Bugs and Greyson TS Areas.

In timber sale harvest units, the magnitude of soil compaction is evaluated using results of monitoring soil infiltration and soil bulk density. In 4 of the 6 sites evaluated, infiltration and/or bulk density data indicate the magnitude of soil compaction is statistically significant, with a 95% confidence interval: With the one-way analysis of variance (ANOVA) tests, 4 of the 6 monitoring plots showed statistically significant change in soil bulk density for soils disturbed by skid trails and logging roads associated with timber harvest compared to undisturbed soils (Table F3-1). This statistically significant change indicates the magnitude of soil compaction resulting from harvest activities constitutes detrimental disturbance for these four harvest units.



<b>Table F3-1, Summary of Bulk Density Data Statistical Analyses (using SPSS), For Soil Monitoring in Timber Sale Areas</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 # of Samples</b>
06SF001	.423 = no significant difference	.005 = Significant difference	Significant difference between Howes' classes 0 & 5	12
06SF002	.081 = no significant difference	.295 = no significant difference	No significant difference	9
06SF003	.852 = no significant difference	.388 = no significant difference	No significant difference	12
06SF008	.857 = no significant difference	.107 = no significant difference	No significant difference	9
06SF027a	.131 = no significant difference	.007 = Significant difference	Significant difference between Howes' classes 0 & 1 and Howes' classes 0 & 2	9
06SF027b	.052 = Significant difference	.001 = Significant difference	Significant Differences between Howes' Classes 0 & 1 and Howes' classes 0 & 5	9

With the one-way analysis of variance (ANOVA) tests, 3 of the 4 monitoring plots showed statistically significant change in soil infiltration rate for soils disturbed by skid trails and logging roads associated with past harvest compared to undisturbed soils (Table F3-2). This statistically significant change indicates the magnitude of soil compaction resulting from harvest activities constitutes detrimental disturbance for these three harvest units.

<b>Table F3-2, Summary of Infiltration Data Statistical Analyses (using SPSS) For Soil Monitoring in Timber Sale Areas</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>
06SF001	.386 = no significant difference	.008 = Significant difference	Significant differences between Howes' classes 0 & 3 and Howes' classes 0 & 5	12
06SF008	.522 = no significant difference	.007 = Significant difference	Significant difference between Howes' classes 0 & 3	9
06SF027a	.155 = no significant difference	.326 = no significant difference	No significant difference	9
06SF027b	.122 = no significant difference	.000 = Significant difference	Significant difference between Howes' classes 0 & 5	7

In assessing the amount of area affected by all types of detrimental soil disturbance (i.e. compaction, rutting, displacement, erosion, severe burning, and mass wasting) in timber harvest units, results of this monitoring also show that Best Management Practices (BMPs) were effective in limiting the amount of area affected by detrimental soil disturbance to comply with the Forest Plan measure of soil variability (i.e. limiting extent of detrimental disturbance to 20% or less of the activity area; Table F3-3). The mean

value for aerial extent of moderate to severe soil disturbance on these 6 plots was 5%, and ranged from 2% to 11%.

<b>Table F3-3. Results of qualitative soil disturbance assessment on Helena National Forest</b>						
<b>Timber Sale Name &amp; Unit Number:</b>	<b>Poorman TS Unit 8</b>	<b>Poorman TS Unit 15</b>	<b>Snow Talon TS Unit 50</b>	<b>Grassy Bugs TS Unit 1</b>	<b>Greyson TS Unit 1</b>	<b>Greyson TS Unit 5</b>
Year & Season Of Harvest:	2001 Summer	2001 Summer	2005-2006 Winter	2003-2004 Winter	2004-2005 Winter	2005 Summer
Harvest Prescription:	Green tree regeneration cut	Green tree thinning	Post-fire salvage	Green tree thinning – bug salvage	Green tree thinning – bug salvage	Green tree thinning – bug salvage
Harvest Methods:	Trees cut using feller-buncher; Yarding with grapple-skidder on designated skid trails; whole tree removal	Hand felling; Skyline yarding with designated corridors; whole tree removal	Trees cut using feller-buncher; Yarding with grapple-skidder on designated skid trails; whole tree removal	Trees cut using feller-buncher; Yarding with grapple-skidder on designated skid trails; whole tree removal	Trees cut using feller-buncher; Yarding with grapple-skidder on designated skid trails; whole tree removal	Hand felling; Skyline yarding with designated corridors; whole tree removal
Slash Disposal Methods:	Planned for broadcast burning – but slash piles burned at landings instead	Broadcast burned	Slash piles to be burned at landings – not yet implemented	Slash piles burned at landings	Slash piles to be burned at landings – not yet implemented	Slash piles to be burned at edge of unit – not yet implemented
Acres Evaluated:	Approx. 8.5	Approx. 36	Approx. 12	Approx. 20.5	Approx. 20.5	Approx. 5
Total Points Sampled:	83	359	121	203	204	50
Points In Classes Of Moderate To Severe Soil Disturbance:	5 (~6%)	8 (~2%)	3 (~3%)	22 (~11%)	12 (~6%)	1 (~2%)
Field Notes:	Sample points included evaluation of landings & a reclaimed temporary road within the unit boundary	All sample points with moderate to severe soil disturbance were classified as such because of severe soil burning during slash treatment	Sample points included evaluation of landings & a road adjacent to the unit boundary	Sample points included evaluation of landings & a temporary road within the unit boundary	Sample points included evaluation of landings & a temporary road within the unit boundary	There were no temp. roads or landings associated with this unit, because skyline yarding eqt. operated on an existing, forest system road

In conclusion, results of the monitoring in timber harvest units document that the magnitude of soil compaction is statistically significant, and is thus considered "detrimental" soil disturbance, in 4 of the 6 timber harvest sites evaluated. Nonetheless, the aerial extent of all types of soil disturbance (i.e. compaction, rutting, displacement, severe burning, accelerated erosion, and mass wasting) "detrimentally" affects less than 20% of the area in the evaluated timber harvest units. Thus, this monitoring demonstrates that the timber harvest units evaluated are within the acceptable levels of Forest Plan variability for detrimental soil disturbance.

#### *FY06 Monitoring Activity 2*

Data from the field assessment of post-treatment soil conditions in unit 1 of Deep Creek Fuels Project documents that implementation of the prescribed burning effectively implemented Best Management Practices specified during the project planning process (Farley 2004):

- Visual data demonstrates that the burn prescription was effective in limiting the area of severe soil burning to less than 15% of the area evaluated.
- Visual and soil cover data demonstrate the burn prescription was effective in retaining adequate soil cover (i.e. greater than 50% soil cover on slopes with less than 35% gradient and greater than 70% soil cover on steeper slopes) to control erosion.
- Infiltrometer data indicates that soil water repellency was not significantly increased by burning, because the average hydraulic conductivity values are within those defined for "low" water repellency class on both burned and unburned areas in each monitoring plot (Robichaud 2004). Thus, there is low risk for erosion and runoff following burning.

In conclusion, monitoring of post-treatment soil conditions in unit 1 of Deep Creek Fuels Project documented that fuel treatment actions successfully implemented the recommended soil BMPs and mitigations within Unit 1. Further, these BMPs and mitigation measures were effective in achieving desired soil conditions. Finally, the amount of area affected by all types of soil disturbance (i.e. compaction, rutting, displacement, severe burning, accelerated erosion, and mass wasting) "detrimentally" affects less than 20% of the area in the evaluated fuel treatment unit. Thus, this monitoring demonstrates that the fuels treatment units evaluated are within the acceptable levels of Forest Plan variability for detrimental soil disturbance.

#### **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%.

##### *Assessment:*

The results of FY06 monitoring indicate that the implementation of BMPs in both timber harvest and fuels treatment units have been effective in limiting detrimental soil disturbance to comply with the Forest Plan measure of variability for 20% change in soil properties. This conclusion is 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 measurement 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 2007, and subsequent years, to validate the continued effectiveness of implementing soil-related BMPs.

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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 41I. 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 41I (main stem Missouri) except for one in 2005. There was no change in 2006. The one outstanding claimant has withdrawn their claims just recently.

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 was investigated for this site in 2005. Investigation and search for water right was completed in 2005 and a contract was let to submit an Application to Change a Water Right in 2006. This application was finally submitted to DNRC as of March 19<sup>th</sup>, 2007.

*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. Application has been submitted to acquire a suitable water right for Snowbank Lake.

**Variability Measure Discussion:**

*Variability Measure:*

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

*Assessment:*

A suspected paperwork mix-up necessitates possible Forest action to acquire (re-acquire) water rights on Snowbank Lake.

*Actions in response to variability assessment:*

Work through the Statewide adjudication process for Snowbank Lake.

**Recommended Efforts:**

Follow through on water rights application to the State for Snowbank Lake.

## **(G)Minerals**

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### **(G1) Forest Service Land Uses That May Affect Minerals Activities**

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**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:**

*1. 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.

## 2. 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.

## 3. 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.

## 4. 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.

## 5. 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.

*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.

*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 Measures:*

- Departure from approved operating plan or violation of assigned stipulations.
- Unacceptable review of lease application by ID Team
- Unacceptable restrictions on mineral development

*Assessment:*

1. 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.
2. 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.
3. 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.

## **(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 2006, volume in stands at risk to mountain pine beetle was sold in Jimtown Fuels. In the 5 year planning timeframe, much of the timber harvest has been focused on fire salvage. However, several projects did target stands at risk to Mountain Pine beetle (Lincoln Compound, Grassy Bugs and Greyson Bugs).

##### *Monitoring Results:*

Most insects and diseases continued to increase across the Forest in 2006 during the 5-year monitoring period since 2002. The exception is Douglas-fir beetle, which was on the rise during the first part of the period but as of 2006 is on the decline. 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, as noted in a 2006 Forest Health protection trip report (MFO-TR-06-17, project file). Mountain



pine beetle is increasing in severity and distribution across the Forest. The bulk of this infestation is in lodgepole pine, but ponderosa pine and whitebark pine are affected as well. Western spruce budworm defoliation also continues to increase, which could in turn increase Douglas-fir beetle activity. This insect has caused notable mortality in the Flesher Pass area in particular, as noted a 2006 Forest Health Protection trip report (MFO-TR-06-10, project file). Formal data is not available yet for the 2006 aerial detection flight; however, based on visual observations of the draft map product, all insect and disease activity is increasing in infestation patch size and distribution. 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, as noted in MFO-TR-06-05 (project file).

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 2006, 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). Projects that have been at least partially implemented since 2002 include Greyson Bugs (2006), Snow Talon (2006), Grassy Bugs (2004), and Lincoln Compound (2004).

Silvicultural review of the Greyson timber sale in progress as documented in August and September 2006 confirmed that mountain pine beetle activity was continuing; additional timber was marked for removal as a result (project file).

#### 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.

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 FY06.

*Data Analysis Methods:*

N/A

*Monitoring Results:*

A total of 3,578 acres of natural fuels were treated in FY06.

**Variability Measure Discussion:**

Variation of +/- 25% of programmed targets will initiate action.

*Variability Measure:*

+/- 25% of programmed targets.

*Assessment:*

Variability is within acceptable limits.

*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

**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 7,094 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:*

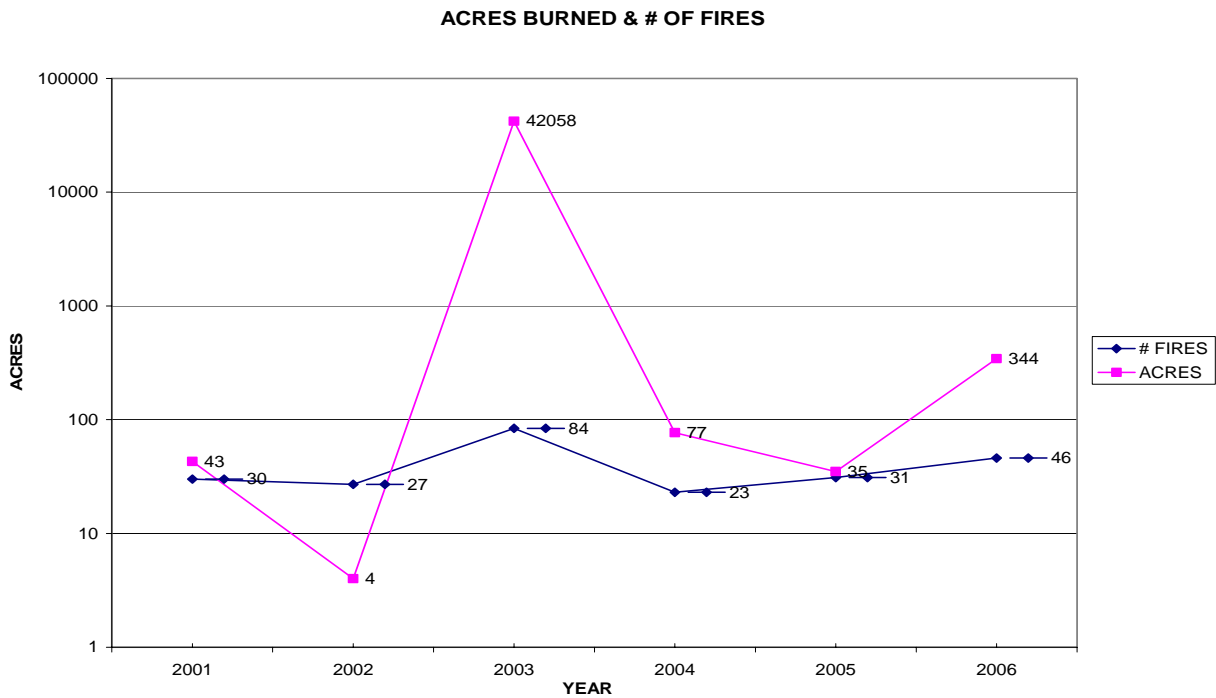
The variability on average is within acceptable limits if you do not count the large fire year of 2003 being above the 25% projected average of wildfire burned acres, if the large fire year of 2003 is considered the variability is outside of the acceptable range.

*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 2006 the Forest spent \$ 1,778,806 in the suppression of wildfires. The 5 year average is \$ 5,124,260 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.

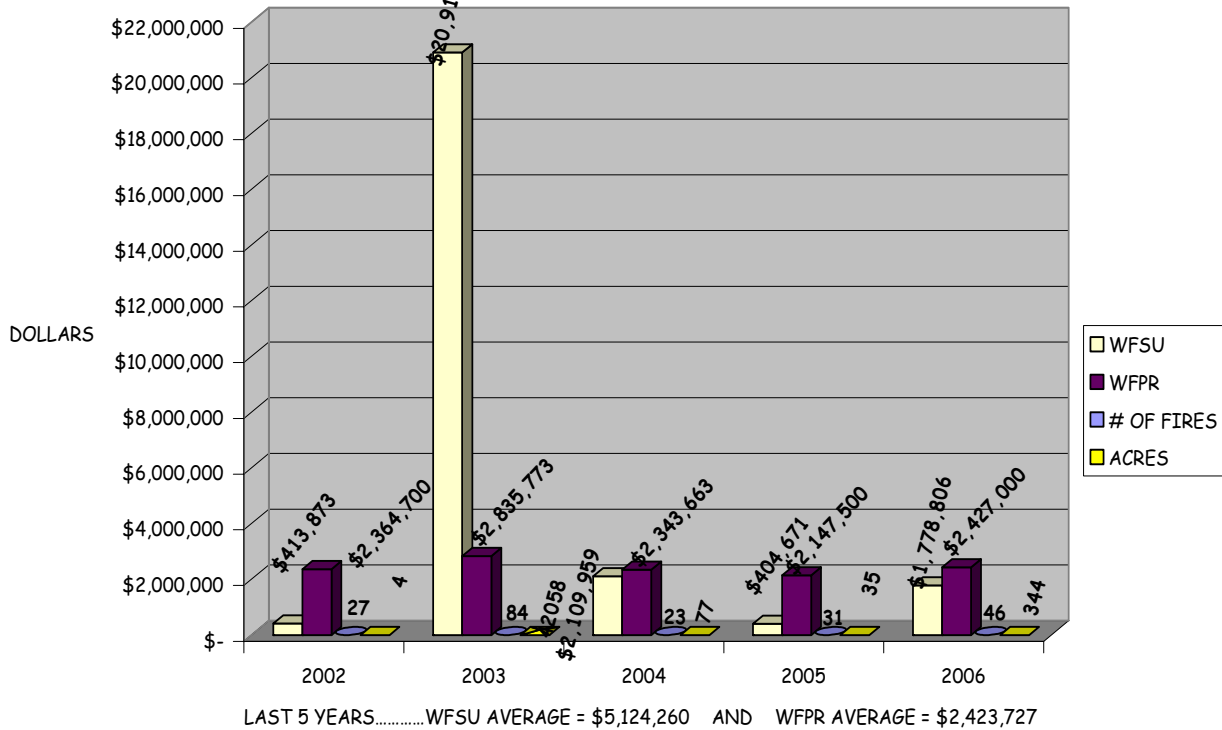
#### *Actions in response to variability assessment:*

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 FY06 MONITORING REPORT  
(WFPR costs does not include cost pools, OWCP, etc)



## (L1) 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, accomplishment reports, EA's, transportation plans, and final construction reports. TIS inventory has been replaced by the FS intranet database program, 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 the Forest Service Manual and Best Management Practices (BMPs).

**Monitoring Activity:**

Any new road construction would be subjected to following 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, Mi. to be Constructed Each Yr.
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
2004	2832	888	0	0	2025	+22
2005 (2)	2829	888	0	0.3 (3)	2047	+22
2006 (2)	2831	893	0	0	2069	+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) These 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:*

The actual number of road miles is under the projected amount using 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:

#### 1) Collector roads.

- a. yearlong closures
- b. seasonal closures

#### 2) 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 are 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.

Year	Forest Plan Assumption (miles)	Actual
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. However, it was not.

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 and 32% in year 2006.

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 2006 cumulatively represents the situation in the years between 1986 and 2006, 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.

## **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 Methods:**

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 and last examined. 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. The results of monitoring efforts are included in the annual heritage report for that year which is submitted to the State Historic Preservation Office (SHPO) for review. Ultimately, all site monitoring data will be entered into INFRA.

**Current Efforts and Findings:**

Annual monitoring was completed on an opportunistic basis for INFRA-listed "priority assets" in 2006. This generally was done in the course of pursuing other fieldwork and the inspections generally involved a quick and directed inspection. As in previous years, these monitoring "events" have not yet been entered into the forest's INFRA database. Limited resources and competing priorities precludes implementing a more aggressive site monitoring program.

<b>Heritage Sites Monitored in 2006</b>			
24BW9 (P)	24BW810 (P)	24BW1054 (P, C)	24LC1719 (M)
24BW10 (P)	24BW811 (P)	24JF536 (B)	24LC1722 (M)
24BW19 (P)	24BW760 (LS)	24JF537 (B)	24PW476 (M)

Heritage Sites Monitored in 2006			
24BW74 (B)	24BW893 (P)	24LC272 (C)	24LC1719 (M)
24BW105 (LS)	24BW894 (P)	24LC467 (H)	24LC1722 (M)
24BW759 (Q)	24BW1053 (P, C)	24LC687 (Q)	24PW476 (M)
24LC1015 (LS)	24LC1018 (LS)	24LC1023 (LS)	24LC1719 (M)
24LC1287 (Q)	24LC1707 (P)	24LC1710 (M)	24LC1722 (M)
24LC1711 (M)	24LC1712 (M)	24LC1713 (M)	24LC1719 (M)
24LC1716 (M)	24LC1717 (M)	24LC1718 (M)	24LC1722 (M)
24BW726 (LS)			24PW476 (M)

B: building; C: cave; H: historic archaeological; LS: lithic scatter; M: mine; P: pictograph; Q: quarry

No incidences of looting, vandalism or other site depredation were noted at any of the inspected sites in 2006. Natural processes were the primary issue—erosion, vegetation growth and dead timber falling atop the sites. In terms of historic buildings, the plywood covering the part of the storage building Charter Oak Mine was forcibly removed in the spring of 2006 but little other evidence of vandalism was noted.

During the 2006 field season it was noted that a ponderosa pine had blown down atop prehistoric quarry site 24LC687 and bushy vegetation disguised the prehistoric quarry pits. But several spalls from quartzite hammer stones and biface fragments were in the same location as recorded several years ago. Likewise, Gold Rush-era stone bread oven and house foundation ruins in nearby Cave Gulch showed no obvious signs of vandalism (looting) but bushy vegetation growing inside the historic features (since the 2000 Cave Gulch wildfire) was disturbing the placement of some rocks.

In July of 2006, the HNF completed a small-scale archaeological testing project at three rockshelters near the mouth of Beaver Creek near the Missouri River. The week-long testing project was implemented with six *Passport in Time* program volunteers and two HNF archaeologists. The primary focus was Beaver Creek Cave (24LC272), a prehistorically occupied cave located in limestone cliffs above Beaver Creek. The interior cave chamber was badly looted and approximately half of its cultural deposit is gone. Small amounts of bone and chipped stone artifacts were recovered from the excavations of the three sites. Radiocarbon dates were obtained from one of the tested sites and the age of the site ranges between 3,360 and 3080 years before present. The excavation work will be used to determine site protection policy and future site preservation and management strategies.

In 2006, the HNF completed abandoned mine reclamation at five historic lode mines located in the upper Little Blackfoot River drainage southwest of the Continental Divide and MacDonald Pass. National Register of Historic Places (NR) eligibility evaluations were done in conjunction with mine remediation planning. Four of the five mine sites targeted for reclamation were small operations involving limited ore production and mine development. None contained unique or remarkable structural features, nor are they associated with persons significant in local or regional mining or other history. Several were operated in the 1940s-1980s, and thus barely meet the 50-year NRHP threshold. The Evening Star (eligible) and Kimball (ineligible) were reclaimed in 2004 and 2005, respectively, and have been summarized in previous annual compliance reports. Reclamation occurred at the Third Term, Telegraph, and Viking Mines in 2006. Of these three sites, only the Telegraph Mine was deemed eligible for inclusion in the National Register at the local significance level. The Monarch Mine, also a NR-eligible property, is targeted for remediation in 2007 (or later).

Upper Little Blackfoot Mine Reclamation Sites		
Mine Site	NR Eligibility	Reclamation Construction Year
Kimball	No	2004
Evening Star	Yes	2005

Upper Little Blackfoot Mine Reclamation Sites		
Hope	No	2006
Hub Camp	No	2006
Telegraph	Yes	2006
Third Term	No	2006
Viking	No	2006
Monarch	Yes	2007

In accordance with the FS Region One historic mining programmatic agreement, an effects analysis, property treatment plan and memorandum of agreement are needed for remediation work at National Register-eligible mining sites.

In 2006, the HNF addressed structural and health-safety concerns at the Strawberry Butte Lookout (24JF536), located atop Strawberry Butte some 6 miles southeast of Helena. The steel cab lookout and its associated cabin were built in 1941 and the property is eligible for listing in the National Register. The rehabilitation project addressed a variety of concerns identified in a 2003 Forest Service inspection report, including removing old hog wire and hand rails; extending handrail height and adding a support brace; adding metal struts under the platform deck boards; replacing wood steps to original dimensions; and constructing a secure entrance with gate.

Of these major repairs or safety corrections at Strawberry Butte Lookout, controlling lookout access was the most problematic from a historic preservation perspective. Lookout access was blocked at the bottom of the stairs by a single chain with a small sign. Several options were considered, such as constructing a chain link fence around the base of the lookout or removing the bottom section of the stairway when the lookout was not in use. These had both practical and visual problems. Eventually, the HNF and Montana SHPO agreed to a simple metal frame and door system located on the second level of the lookout. Putting the lockout system on the second level abated concerns about its visual intrusiveness at the base of the lookout but still lookout access would be secure during winter months.

#### 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 as seen in 2006 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.

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, have still yet to

be developed due to time and funding constraints. Protection measures for highly significant heritage resources on the HNF need to be fully and effectively implemented, and then monitored.

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 2007 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.

## **(T) Economics, Adjacent Lands, Resources, and Communities, and All Resources**

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### **(T1) Economics**

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

Verification of unit cost used in the Forest Plan compared to on-the-ground cost.

#### *Intent:*

Acquire accurate cost data.

#### **Data Sources:**

Timber sale appraisals, contracts, allotments, management plans, cost/output for various resource programs, sale area betterment plans, and timber sale reports.

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

#### *Documentation of Monitoring Methodology:*

Review and summarization of data from data sources described above. The economic information is monitored is available from data sources such as the annual PTSAR report, Annual cut and sold report, TIM database and FACTS.

#### *Monitoring Activity:*

Review Forest timber budgets and annual timber volume sold to evaluate unit costs.

#### *Data Analysis Methods:*

Total funded program dollars for NFTM and SSSS adjusted to fiscal year 1986 dollars were included in the cost for the timber program. Volume sold by fiscal year was used to display outputs for comparison.

#### *Monitoring Results:*

Two of the past five years, unit costs have been within Forest Plan variability. 2003 and 2004 had very high unit costs. Budgets were generally flat and volume offered was much less than planned. Volume planned to be offered in FY03 and FY04 was associated with fire salvage sales. The Forest request and was funded for a program commensurate with expected outputs, however due to delays in NEPA appeals material that was planned to be sold was much less than expected due to product deteriorate between initial field reconnaissance and time of sell.

Unit costs have generally increased since the Plan was developed in the mid-80's. At the same time, unit revenues have increased as well. The objective of the T-1 monitoring element is to provide program managers with a tool to assess the overall costs and benefits of a given resource program relative to the programmatic Forest Plan assumptions.

#### Variability Measure Discussion:

##### *Variability Measure:*

In general, +/- 25%. However, very large cost items, such as road constructions and logging cost would have a smaller degree of acceptable variability i.e. 10%.

##### *Assessment:*

Concerning the cost/unit of output category, changes in overall agency objectives since 1986 have resulted in much less emphasis on producing timber outputs. The lower quantity of outputs are now affecting certain unit costs, but the lower outputs are tied more to changes in emphasis than having been created by unit cost variability. However, in terms of the flow diagram the Forest has revised the cost/unit portion of the budget as cost/units are revised. In addition, the cost variations the Forest has experienced in comparison with Plan projections have not resulted in a backlog of work or in quality of output deficiencies such that it has not been necessary to reprogram funds for this reason.

We have experienced both increases and decreases in timber program costs in comparison with Forest Plan projections, resulting in an overall program that would not merit substantial adjustment. Given that the agency wide objectives have evolved since 1986 in the sense that resource programs are viewed more as a tool to meet Plan goals and objectives than as a mean to accomplish targets, it was concluded that no further action is needed at this time.

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

Per Forest Plan guidance, the cost deviations were considered within the Decision Flow Diagram found on page IV/20 of the Plan. In review, it was determined that the Forest has experienced both recurring and non-recurring cost deviations, but even in the case of recurring deviations this situation would not result in serious consequences. This doesn't constitute a management oriented practice. Per the diagram, this is a cost/benefit oriented situation. At that juncture of the flow diagram, a determination is necessary as to whether the "cost/unit of output is insufficient to maintain quality or quantity of outputs" or whether the "budget is insufficient to produce projected quality or quantity of outputs". The latter category does not fit as the budget is sufficient to support the current program of work.

#### Recommended Efforts:

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.

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## **(T2) Adjacent lands, resources, and communities**

#### Forest Plan Requirements:

The effect of National Forest management on adjacent lands, 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. Determine effects of management of other ownership on Forest Plan.



### Current Efforts and Findings:

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.

### 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:

No actions are recommended at this time.

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## **(T3) Forest Plan Table IV-1 Monitoring Requirements**

### 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. appeals/litigation trends and Forest Service/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 2006.

SOPA/PALS:

In an effort to improve public service, the Helena NF Planning staff 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 contains 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 public 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 2006.

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 One process that reviews these appeals and identifies the appeal points presented by the appellant. Identified 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 the pleasure and uses of our National forests.

*Documentation of Monitoring Methodology:*

Community Outreach:

Ongoing community outreach programs continue to grow 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 provide the needed information on 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 document all that occurs 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 One, 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 findings 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, Moonlight Hike, Scats and Tracks, Weather Activities, Tree Identification, Fire Safety, Tree biology, Bats, Lost in the Woods, Map & Compass, Lookout Discovery Day, Owls of Montana, etc. are but a few of the events that were provided in 2006.

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 2006, the larger projects included the Lynx amendment (Region wide), Noxious Weeds Project, South Belts Travel Plan, Cabin Gulch Vegetation Management, Allotment Management Plans, Spring Hill Exchange, East Stemple Hazardous Fuels Reduction, and the MacDonald Pass Biathlon.

Forest Appeals:

The appeal on the Helena NF addressed in this monitoring report is the Elliston Face Hazardous Fuels Reduction Project.

***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 basis 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 used 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:

For larger 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 mitigate the concern, or used to enhance and improve the resource effects analyses.

Forest Appeals:

The above appeal on the Helena NF in 2006, was 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 2006, over 3,400 people participated in the Helena NF/Montana Discovery Foundation sponsored events.

SOPA/PALS:

There were about 43-54 projects listed in any given quarterly SOPA in 2006 that contained a variety of projects from noxious weed control, mineral extraction/exploration, fuels reduction, watershed improvement, 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/FONSI's, or record of decisions. The status of these projects varied from scoping, developing the proposal, conducting 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 Forest Plan, it 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. Therefore it is 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 South Belts Travel Plan that is too restrictive for access to our Forest lands, the Cabin Gulch Vegetation Project treating too many acres reducing wildlife habitat, and the MacDonald Pass Biathlon which 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 displays the main project appealed in 2006 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).

Project Name	Appeal #	Appeal Point (Summarized)
Elliston Face Hazardous Fuels Reduction	#06-01-00-0041	Issue: Inadequate documentation showing compliance with the Forest Plan snag standards.

A copy of 2006 appeal review officers report to the appeal deciding officer is in the project file.

**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’ve said and what they’ve submitted during the programs and events and NEPA/appeal processes.

*Variability Measure:*

What actions is the Forest implementing and are these actions successful?

*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 do address interesting and emerging environmental issues.

The Helena NF addresses issues throughout NEPA and appeal processes. 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. The Helena NF also takes learned lessons from a given Forest project and applies these lessons to the design and development of future Forest projects.

In looking at the cross section of differing data including community outreach, SOPA/PALS, Forest NEPA, and Forest Appeal, the intent of this Forest Plan Monitoring Item T3 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. 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 develops a different strategy or approach in designing 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 should continue to 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:

<b>Amendment #</b>	<b>Description</b>
5	Sheriff Gulch management allocation change
8	Gypsy 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 2006 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 2006.

*Monitoring Results:*

No Forest Plan allocation changes during 2006 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.

*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)**

### **Youth Forest Monitoring**

#### **Background**

The Youth Forest Monitoring Program (YFMP) is a summer student internship program for high school students entering grades 9-12. Begun in 1998 as a partnership between the Montana Science Institute and the Helena National Forest, the program has grown to include the following partnerships: Montana Discovery Foundation, University of Montana – College of Technology, Jefferson County, Lewis & Clark County, Powell County, and the Tri-County Resource Advisory Committee (Deerlodge, Granite, Powell).

The purpose of this program is for high school students to learn about forest ecology, monitor specific forest health parameters and report back with recommendations to the forest. In the process YFMP students network with forest professionals, inspiring many to pursue a career in the field of resource management. Since 1998 over 64 students have gone through the program. In 2006, twenty students applied and 12 were accepted into YFMP. These students were placed in 4 teams: 3 based out of Helena, and 1 team based out of Lincoln for the second year of satellite programs. These teams monitored 37 sites during the 2006 field season.

## Helena Weed Monitoring Team

The Helena Weed Team focused their studies on 9 sites on the Helena and Lincoln districts: Heart Lake, Oregon, Oregon/Brown, Slim Sam, Priest Pass, Magpie, North Fork of Warm Springs Creek, Grizzly Gulch, and Tree Farmer Road. All sites were recorded using GPS receivers, and data sheets presented in a written report and CD.

Weed transect sites monitored nested frequency, density, ground cover, and point cover. In areas of very dense vegetation, line intercept monitoring was used on the transects. Modified data sheets based on TERRA forms were used at all sites.

Top recommendations/observations from the Helena Weed Team include: (1) Continue to monitor yearly Oregon Gulch and Oregon Gulch/Brown, two sites which are recovering from the 2000 Cave Gulch Fire. YFMP students continue to monitor the Oregon/Brown site that was initiated by a DOW Chemical grant with weed scientist Melissa Brown, and an MOU for monitoring assistance from the Helena National Forest. Oregon/Brown underwent three types of herbicide regiments: Tordon, Tordon and Plateau combined, and Non-treated. The field season of 2006 marked the sixth year of data collection at these sites after the wildfire. Results from 2001 – 2004 were published in a scientific journal.

New data from field season 2006 continues to support a trend in Oregon/Brown that at the highest intensity burn sites, left untreated, dalmation toadflax had a lower density (10-15 less stems/m<sup>2</sup>) than the Tordon or Tordon-Plateau combined. At the moderate burn intensity site, Tordan-Plateau combined equaled untreated regime for lowest density of dalmation toadflax. At the lowest burn intensity, the Tordon-Plateau combination had the lowest dalmation toadflax density. (2) At Slim Sam, where the biological control agent *Agapeta zoegana* had been released several times between 1990 and 1999 to eradicate spotted knapweed, none of these invasive species were present in the study plots. (3) At Magpie Gulch, *Tricosirocalse horridus* had been released in 1994 to control musk thistle. However, in 2006 the density of musk thistle was high.

These three observations underscore the importance of researching the history of an area before treatments, and how no two areas are alike. Biological control may not be successful on its own in Magpie Gulch, and may require supplementary treatments such as hand pulling. In other areas, such as Oregon/Brown, chemical control may not be suitable in areas of high burn intensity, where native seed banks are already compromised.

## Helena Stream Monitoring Team

The Helena Stream Monitoring Team visited 11 sites during field season 2006: Heart Lake in the Scapegoat Wilderness, Snow Bank Creek, Magpie Creek, Vermont Creek, Sulphur Bar Creek, Deep Creek, Slim Sam Creek, South Fork of Crow Creek, Eagle Creek, Buffalo Creek, and Corral Creek on the Lincoln, Helena and Townsend districts.

Stream monitoring data included: cross-section surveying, pebble count method for stream bed morphology, sinuosity and slope for stream bank morphology, macroinvertebrate sampling, and water chemistry data such as temperature, pH, conductivity and dissolved oxygen readings. At Snowbank Creek, YFMP students took stream core samples to evaluate trout spawning sites for silt levels and porosity. All sites were photographed and marked with GPS units.

Several observation and recommendations were brought forward by the stream monitoring team: (1) Sulphur Bar Creek, which was burned in the Toston Fire of 2000, and last monitored in 2003, had sensitive macroinvertebrates thriving in its waters, vegetation was growing back, the elk enclosure had thick aspen stands, all signs of a vulnerable ecosystem recovering. More sensitive mayflies and caddisflies increased in the study sample while less sensitive aquatic worms decreased between 2004 and 2006. (2) Magpie Creek, which had been intensely burned in the 2000 Cave Gulch Burn had a history of



high silt levels and off-road recreational impact. In 2006 water chemistry levels were within range and stable. Dissolved oxygen increased from 7.43ppm to 8.4ppm between 2005 and 2006 in response to increased vegetation growth and shading. The primary problem in Magpie Gulch still are the ATV tracks that cut through the stream and erode the banks, despite signage in the area prohibiting off-trail riding. Increased patrolling of the area might address this problem. (3) Confederate Gulch was not a site visited by the Helena Stream Team, but observed on the way to another site. It is a private claim that is currently undergoing small-scale and internet-advertised mining. The stream bank has been diverted to allow for a dredge process of mining. Upon further research, the team learned that even private claims must follow state water quality regulations. Students recommend setting up transects on stretches of the stream both above and below the mining operation. The location of these transects will be on the adjacent Forest Service lands. (4) YFMP stream monitoring in 2007 should include sites on the Ten Mile Watershed, Helena's primary watershed source.

### Helena Soil Monitoring Team

The Helena Soil Team monitored 8 sites on the Helena, Lincoln and Townsend districts: Heart Lake in the Scapegoat Wilderness, Oregon Gulch, Slim Sam, Priest Pass, Trail Gulch, Magpie Gulch, North Fork of Warm Springs Creek, and Bull Sweats Unit 3.

Data collection at these sites included soil texture, color, and structure, infiltration, rooting depth, and downed woody debris test. Each site was recorded by GPS, and photopoints were taken at each transect.

The Helena Soil Monitoring Team had the following observations and recommendations: (1) Infiltration rate increased from 60cm<sup>3</sup>/hr to 110cm<sup>3</sup>/hr while rock composition increased in the point cover of Oregon Gulch between 2005 and 2006. These readings could be the result of increased erosion of the hillside, where vegetation is not coming back soon enough. (2) Priest Pass was a new study area this year. It is the site of a large off-road recreational vehicle track, and close to homes in the wildland/urban interface. Slash and prescribed burn are two treatments slated for the area. Students are studying pre and post treatment and were able to get baseline data in 2006. Further monitoring at Priest Pass is recommended to determine the effect of off-road recreating and the influx of weeds after a prescribed burn. (3) North Fork of Warm Springs Creek monitoring site appears to be recovering well from recreational vehicle compaction. Infiltration increased from 2003 to 2006, indicating effective drainage. More signage discouraging off-trail ATV use could be used at both North Fork of Warm Springs Creek, and Priest Pass.

### Lincoln Monitoring Team

The Lincoln Monitoring Team visited 9 sites on the Lincoln district in 2006: Alice Creek (weeds), Blackfoot River near Mike Horse Dam (stream), Copper Cr. (weeds), Davis 9 (soils, weeds), Ethel 30 (soils), Moose Cr. (weeds), Snowbank Cr. (stream core), Stonewall (streams), and Wasson (streams).

The Lincoln Team completed all of the weed, stream, and soil monitoring described above but at fewer sites. All monitoring sites were marked and recorded with GPS units and photopoints were taken. A majority of the data was baseline and will be more useful in later years when students return to the sites for cyclical monitoring.

Recommendations and observations by the Lincoln Monitoring Team include: (1) Return to Davis 9 to determine whether a prescribed burn in Fall 2006 reached the management goal of increasing vegetation cover by 50%, optimize overall wildlife, and increase old growth forest. (2) Continue to monitor the headwaters of the Blackfoot River where the earthen Mike Horse dam is slowly deteriorating and the question of how to address this concern is still up in the air. The study stretch will be located below the dam and far enough away from any construction that may ensue. A brief test macroinvertebrate sample indicated that only 3 individuals were collected in over 60 minutes of searching, an indicator of poor water quality. (3) A large population of dalmation toadflax was monitored at Alice Creek before the

Lincoln Weed Crew sprayed the entire population in late summer 2006. The Lincoln Team will return in 2007 to evaluate the effectiveness of the chemical treatment. (4) Snowbank Creek was monitored for fish spawning habitat. Previous years' data was available through the Lincoln District fisheries biologist. The friedel index, a measure of the pore size and relative permeability of the stream bed layer, increased from 3.5 to 5 between 2003 and 2006. A score of 4 is acceptable.

## 1994 Five Year Review Recommendations

A five-year, comprehensive review of the Forest Plan was completed in 1994. Ten Forest Plan amendments were recommended in the process of that review. The following documents the recommendations of the 1994 Five Year Review and presents the current Interdisciplinary (ID) Team's review of those prior recommendations. A copy of the 1994 Fire-Year Review can be found in the project file.

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### Recommended Amendment 1: Monitoring Elements P4 and P5--Protection Acres

#### 1994 Five Year Review Recommendations:

The Five Year Review stated: "Monitoring Item P4: Change the wording in the Forest Plan to reflect that PARS are to be used to determine potential impacts on resource outputs as a result of wildfire burned acres. Specifically, on page IV/17, under INTENT for Item P4 change the wording to read "Assume wildfire acres are within projected annual burned acres and evaluate any increases on the forest's ability to produce expected outputs"; under responsibility, change from Timber Staff Officer to Natural Resource Team Leader (the change to Natural Resource Team Leader also applies to Items P2, P3 and P5).

Monitoring Item P5-no wording change in the Plan is required. Use the following system to determine cost effectiveness of the fire management organization:

For the last three years, there has been a system in place nationally to evaluate the effectiveness of the implementation of the fire budget. This is a means of setting and evaluating a target for the fire organization and budget. This target is based on the ratio of dollars spent on indirect cost (overhead) compared to direct costs and is reflective of the ratio described for the most efficient level of funding. In other words, it will show if a forest uses its budget on the initial attack resources planned for, or if it uses fire funding to cover overhead costs at a disproportionate rate. If the initial attack resources are in the amount and time period planned for, the forest is achieving a cost efficient use of its fire management funding."

#### 2006 ID Team Review:

No amendment to change the wording of Monitoring Item P4 was made. An amendment to reflect PARS as the means to determine potential impacts from fire is not needed. National changes in budget levels and program emphasis are generally more responsible for current output levels than are the resource concerns and capabilities identified in the Forest Plan. The primary effect to program outputs has been a shift towards a higher percentage of salvage volume offered relative to green saw timber than was projected in the Forest Plan.

It is not necessary to undertake a Forest Plan amendment for this element, as there are no irreversible or irretrievable impacts to any resource or information due to leaving this element as it was originally designed. The Forest will continue to report this element as it is described.

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## Recommended Amendment 2: Site-Specific Management Area Changes

### 1994 Five Year Review Recommendations:

This recommended amendment dealt with specific Management Area acreage changes. The recommendation stated: "Amendments to the Forest Plan will be made relative to the items listed in the above findings, provided there is adequate analysis to make the changes. Where no analysis exists, an IDT will be assembled to do the analysis. Amendments or changes to the Forest Plan will be made as part of the site specific NEPA analysis or as soon as possible when the deficiency is identified. This will include the effect the proposed amendment/change would have on other resources or the expected timber outputs. Continue tracking these identified MA boundary changes in the FP annual monitoring report identifying the amount of acres shifted from one MA to another as a result of the change/amendment and a summary of the effects these changes have on Forest Plan outputs. The analysis of effects on total forest outputs will be done at a forest level rather than the project level."

### ID Team Review 2006:

Six site-specific Forest Plan amendments which addressed allocation changes have been included in the Helena NF Forest Plan. Amendments 5, 8, 9, 10, 17 and 18 have addressed suitability and dispersed recreation issues. Site-specific Forest Plan amendments will continue to be made on a project-by-project basis where appropriate.

The level of acreage adjustment identified would have no effect on projected outputs during this planning period. There is no need for further action on this proposed amendment.

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## Recommended Amendment 3: Wildlife Monitoring

### 1994 Five Year Review Recommendations:

This recommendation dealt with three items: 1) changing monitoring elements C4, C5 and C6 in regard to the "data sources" identified in the Forest Plan Monitoring Requirements; 2) changing Management Indicatory Species (MIS) species; and 3) dropping monitoring elements C1, C2 and C3 relating to the Elkhorns. The following discusses the recommended changes for each item.

#### *Monitoring Elements C4, C5, C6, C7*

The 1994 Five Year review recommended "[i]mplement solution two." Solution two was described as follows:

"(2) Amend the Forest Plan to:

- modify the data sources to be used for elements C4, C5, and C6. The new data source would be "habitat effectiveness maintained associated with projects resulting from the landscape analyses.
- drop the requirement in element C7 of measuring species density for the three species and, instead, document the amount of old-growth acres retained and lost within each of the major landscape units on the Forest relative to the desired condition for old-growth. Document how the changes or lack of changes measure up to the new Regional guidance on old-growth distribution across the landscape.

#### *MIS*

The Five Year Review recommended "[i]mplement solution two." Solution two for this MIS item stated:

"(2) Maintain the current list of MIS, but modify the Forest Plan whenever interdisciplinary teams determine the important wildlife and fish species appropriate for use as management indicator species within a given landscape analysis area."

### *Elkhorns Elements C1, C2 and C3*

The Five Year Review recommendation was stated as follows: "Amend the Plan to delete C1, C2, and C3. Defer to the proposed Elkhorn Amendment for replacement monitoring elements. At this time there [sic] proposed amendments to the Forest Plan being developed which are based on the Landscape analysis done for the Elkhorn Mountains. The proposed amendments will be analyzed through the NEPA process in FY 1994."

#### ID Team Review 2006:

### *Monitoring Elements C4, C5, C6, C7*

The Five Year Review recommended changing the "data sources" for each of these monitoring elements – not the monitoring items themselves. The recommended change was to focus on data sources that better provided habitat information related to these monitoring elements as the monitoring items themselves related to habitat.

The Forest did not change the listing of data sources in the Helena Forest Plan. However, the Helena National Forest has proceeded to conduct monitoring for these elements using new data sources and methodologies to best monitor the required element. These data sources and methodologies are reflected in the FY 22002/03 and FY2004 and FY2005 Monitoring Reports. The intent of the "data source" column in the Forest Plan Monitoring Requirements Table IV-1 was simply to express the existing possible data sources at the time of the Forest Plan development in 1986 it was not meant to either limit the Forest Service to only those data sources or mandate the use of each of the identified data sources. Rather, the intent of the Forest Plan is to monitor the resource element using data sources that are available, practicable and feasible. Numerous monitoring and analysis tools have been developed since the 1994 Five Year Review. The monitoring and analysis tools that have since been developed allow the Forest to collect data in a manner in which variability, as described for each monitoring element, can be assessed. Therefore, the Forest recommends that we continue to monitor Forest Plan effectiveness by utilizing the Forest Plan Monitoring elements as described with current and appropriate data sources. The following summarizes the monitoring and analysis tools.

### *Landscape Analyses*

The Forest has used the Landscape Analysis process to begin to refine this issue as recommended in the Five Year Report. The Landscape Analyses resulted in the determination that the Forest could continue to operate satisfactorily under the current Forest Plan direction. The landscape analyses were not decision documents, but rather mid-scale analyses to set a context for project, or base level, decisions.

EAWS (Ecosystem Analysis at the Watershed Scale) have been completed on several areas across the forest. These analyses also describe, in general terms, the desired future condition of the area, including goals and objectives of the Helena National Forest Land and Resource Management Plan (Forest Plan) (USFS 1986) and subsequent planning directives. The value of the information presented in the landscape and ecosystem analysis at the watershed scale areas is to set the context for the decision-making process and implementation of the Forest Plan.

Land management decisions are made through the NEPA process. Landscape analyses and EAWS provide recommendations for consideration during this process. Wildlife monitoring as executed per the Forest Plan requirements provides a feedback mechanism for determining the effectiveness of land management decisions.

### *Vegetation Data*

The Forest and the Region have developed baseline information for species' habitat using Forest Inventory and Analysis (FIA) data, as well as other data sources such as FIA grid intensification, Timber Stand Management Record System (TSMRS), and satellite imagery. Field data have been collected on a

base and mid-level scale to provide species-specific habitat information. Because the FIA data plots are re-measured on a regular basis, changes in habitat can be detected.

### *Species Monitoring*

Several protocols have been developed since 1994 that allow the Forest to collect species information in a methodical, systematic approach that better allows us to address variability.

In 1994, the Northern Region of the Forest Service and the Avian Science Center initiated a region-wide landbird monitoring program to develop a better understanding of the habitat relationships of landbirds breeding in the Region. The program is ongoing and continues to contribute to our understanding of species presence and habitat relationships Forest-wide.

Several other survey protocols have been developed with the Avian Science Center, Rocky Mountain Research Station, and others. These protocols allow us to establish baseline data from which out-year monitoring can be conducted. Protocols have been developed for lynx, fisher, goshawks, flammulated owls, woodpeckers, among others. Methodologies have also been improved for winter track data collection.

### *MIS*

The Five Year Review recommended that the current MIS list be maintained but that the Forest Plan would be modified for a landscape area if interdisciplinary teams determined there were important wildlife and fish species appropriate for use as management indicator species within a given landscape analysis area. Landscape Analyses were conducted for the Big Belts, Divide and Elkhorn landscapes but no MIS changes were recommended.

### *Elkhorns Elements C1, C2, and C3*

The Five Year Review recommended that these monitoring items be dropped because they had been completed. The Five Year Review then stated: "[d]efer to the proposed Elkhorn Amendment for replacement monitoring elements." The Elkhorn Amendment was proposed in September 1996. It adopted new goals and objectives for the Elkhorns and provided for new monitoring to monitor those goals and objectives. However, settlement was reached in subsequent litigation that provided until future amendment or revision of the Helena Forest Plan the forest would operate under the 1986 Helena Forest Plan. Monitoring elements C1, C2 and C3 have not been dropped. Montana Fish, Wildlife, and Parks continues to survey elk, mule deer, and bighorn sheep in the Elkhorns. During the early 1990s, a radio-telemetry study was conducted in the Elkhorns that provided information on distribution and population size and structure. Those data provided a baseline; current survey data are important to detect trends over time and to provide a context for landscape capacity for big game relative to other resource interests in the Elkhorns (e.g. livestock grazing).

The Forest, in partnership with the Elkhorns Working Group and other state and federal agencies, initiated a study in 2004 to determine livestock/elk interactions. This study, conducted by Ecosystem Research Group, has provided a baseline in two herd units in the Elkhorns that will allow the Forest to monitor landscape changes and recommend management options to address these changes.

The Forest Plan monitoring elements provide an opportunity to track changes in big game numbers and distribution, to describe current habitat conditions, and to identify land management practices that might affect those habitat conditions.

### *Conclusion*

The Helena Forest Plan FY 22002/03 and FY2004 and FY2005 Monitoring Reports document that the monitoring elements C1, C2, C3, C4, C5, C6 and C7 of the Forest Plan are being monitored with appropriate and current data sources to report on the monitoring elements. With the additional monitoring and analysis tools that have been developed since the 1994 Five Year Review monitoring is

being accomplished, as reported in the Forest Plan Monitoring Reports. The Forest Wildlife Biologist does not see a need to amend the wildlife elements, C1 through C7.

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#### **Recommended Amendment 4: Grizzly Bear Standards**

##### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: "Eliminate the current Forest Plan direction to provide recovery for 18 bears, and, replace it with wording to implement standards for maintenance of grizzly bear habitat. These standards are described in the draft of the revised grizzly bear recovery plan. Although this may affect commodity outputs, implementing this guidance is not discretionary.

Eliminate the verbiage in Appendix D that describes Management Situations 1 and 2 and the standard management direction for each. Also, eliminate the coordination dates and the reference to the "Rocky Mountain Front Grizzly Bear Monitoring and Investigation" (Aune et al. 1984). It is outdated."

##### **ID Team Review 2006:**

Since 1994, grizzly bear research has provided data that allow the Forest to assess the impacts of our management actions. Furthermore, several analysis processes have been developed that allow the Forest to track and identify changes in land management that may affect grizzly bears and their recovery. These include the cumulative effects model "CEM – A model for assessing effects on grizzly bears" and access management guidelines and analysis processes (e.g. moving windows analysis). Also, U.S. Geological Survey, in conjunction with other federal and state agencies, collected grizzly bear hair samples in the Northern Continental Divide Ecosystem (NCDE) in order to estimate a population size and structure. All of this information and analysis tools provide a context for the Forest to assess changes in habitat effectiveness.

The Forest Wildlife Biologist does not see a need for a Forest Plan amendment at this time due to compliance with and implementation of direction given by the Grizzly Bear Recovery Plan and the tracking and identifying tools such as the cumulative effects model and moving windows analysis.

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#### **Recommended Amendment 5: Old Growth Standards**

##### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: "The new definitions for old growth developed in 1992 have been adopted for use in the existing Forest plan. Landscape Analysis will help determine the existing condition and the range of variation that occurred historically. Using the new definitions and the inventory, the Forest will develop standards or guidelines for maintaining old growth by landtypes, landtype associations, Ecological Land Units or some other identifiable land unit described in the Landscape Analysis process. The landscape analysis will also help determine if there are indicator species to represent the old growth dependent group and if a viable population could be supported by old growth stands as they occurred historically. The Forest Plan will be amended (if appropriate) to reflect the finding of the Landscape Analysis."

##### **ID Team Review 2006:**

The Green, et al., definitions for Old Growth (eastside) were incorporated into the Forest Plan as Appendix Z, August 13, 1993. Notification of the incorporation of the definitions was distributed through the Forest Plan mailing list as part of the Forest Plan amendments 8 and 9 notification. The Forest has used the Landscape Analysis process as well as the EAWS (Ecosystem Analysis at the Watershed scale) process to refine historical and reference conditions as recommended in the Five Year Report.

The Forest Plan standards for old growth have been applied across the Forest, identifying managed old growth in all third order drainages. Third order drainages that have not been managed have no impact from management. Old growth will be identified in those drainages during any analysis that proposes vegetation management. Old growth habitat is inventoried in project areas where management actions are proposed.

According to habitat parameters and modeling processes developed by numerous authors that were utilized and cited by Samson (2006), the Helena National Forest has approximately 8,843 acres of northern goshawk nesting habitat, 47,754 acres northern goshawk post fledgling area, and 127,638 acres of northern goshawk foraging habitat. The pileated woodpecker has approximately 5,601 acres of nesting habitat and 14,444 acres of winter foraging habitat on the Helena National Forest. Samson concludes that habitat is well distributed and abundant for the northern goshawk in the Northern Region and by Ecological Province and by National Forest. Habitat on today's landscape is also well distributed and very abundant for the pileated woodpecker. Therefore, viability of both the northern goshawk and pileated woodpecker is not an issue. As such, there is no need to amend the old growth standard.

There is no disagreement among Forest personnel about the Green et al. (1992) definition of old growth. Therefore, there is no need to amend the Forest Plan definition of old growth. The Forest Wildlife Biologist and Forest Ecologist do not see a need for a Forest Plan amendment at this time due to the wide acceptance and functionality of the eastside Green, et al. definitions for old growth.

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## **Recommended Amendment 6: Visual Quality Monitoring**

### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: "Add visual monitoring elements for project activities and for tracking forest-wide visual resource conditions.

The Forest Plan will be amended to add the appropriate monitoring item(s) as recommended. The monitoring items will be developed by the Visual Resource Specialist and the Planning shop. This will be a non-significant amendment and will probably not be done until the forest wide visual resource inventory is completed."

### **ID Team Review 2006:**

The Forest has not amended the Forest Plan to include Visual Quality (VQO) monitoring requirements. There is nothing that precludes a Forest from monitoring and reporting on any item it determines as needed or helpful in its management of the forest beyond those items listed in the Forest Plan. Vegetation and fuels projects are evaluated during the project planning process for compliance with the appropriate Management Area (MA) VQO and monitored at the project level for end compliance by a landscape architect.

There is no need to amend the Forest Plan to include VQO monitoring at this time as the Forest implements MA direction regarding VQO where appropriate.

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## **Recommended Amendment 7: VQO assignments are not consistent.**

### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: "Since the Management Area (MA) VQO direction for all the affected areas is consistent and is appropriate for Wilderness management, the fact that all existing and proposed Wilderness Areas are not also listed in Appendix B is not a critical item in implementing the Forest Plan.

Our recommendation is to add the additional areas to Appendix B if this item can be grouped in with other similar errata items, clarification statements, or document corrections that can be handled simply with a letter to the public or a non-significant Forest Plan amendment. Any time and effort commitment beyond that would be better spent on other issues.

The forest will make the recommended changes to Appendix B to include the proposed Wilderness areas and the Scapegoat wilderness.”

#### **ID Team Review 2006:**

The Five Year Review did recommend an amendment as quoted above. However, the Review also discussed another option stating: “[a] third option, that of doing nothing at this time, also exists since the Management Area direction currently provides consistent VQO direction for all of these areas.” The Forest elected to implement suggested solution option three - that of doing nothing at this time, since the MA direction currently provides consistent VQO direction for all of these areas. The current Plan provides that if an area is found to be in variety class A or C then the VQO will be assigned according to the direction contained in the National Forest Landscape Mgmt. Handbook (FP B/2).

No amendment is needed at this time as long as the Forest actions incorporate MA VQO direction and utilizes Landscape Architects when appropriate.

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### **Recommended Amendment 8: VQO on Continental Divide National Scenic Trail**

#### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: “Incorporate national CDNST direction through Forest Plan amendment. The plan will be amended to correct the wording in chapter II, page 15, #4, to indicate the direction in the FEIS for the CDNST. The wording change will only make reference to the direction rather than restate it.”

#### **ID Team Review 2006:**

The Five Year Review did recommend an amendment but also identified another option – Option 2 – to take no action. The Forest elected to implement suggested solution Option 2 from the 1994 Five Year Review Recommendations. Option 2 is to take no action on Forest Plan language at this time but continue to implement projects using more conservative approach to preserve options for future management actions. The Continental Divide National Scenic Trail (CDNST) EIS and subsequent national management direction are considered as overriding direction to the Forest Plan. The current Forest Plan language states that once a comprehensive plan is approved, that management direction will be incorporated in the Forest Plan (FP II/15). A comprehensive plan has not been approved at this time. The CDNST is managed according to the Forest Plan Management Areas it crosses, but with consideration for the overall national direction for the trail.

The Forest Recreation Planner does not see a need for a Forest Plan amendment at this time as long as any Forest action around the Continental Divide Trail incorporates design features and mitigation from the Forest Plan MA direction that retain the trails integrity as envisioned by the CDNST management direction.

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### **Recommended Amendment 9: Monitoring Cultural Resources**

#### **1994 Five Year Review Recommendations:**

The Five Year Review recommendation stated: “Implementation of all of the suggested monitoring items. Implementing these items will enable the Forest to monitor compliance with existing laws and build a more pro-active cultural resource program. The above recommendations will have some effect on other



resources and assigned and projected outputs. Basically, adding monitoring to the existing cultural resources program would increase the workload for the Forest Archeologist which may in turn have an effect on other resources and assigned and projected outputs. The proposed monitoring should not have any social, political, or economic effects. In total, implementing these changes should impact less than 5% of the cultural resource program of work. Nevertheless, special monies should be solicited from the Regional office and programmed into the Cultural Resource Program to implement the monitoring program.”

#### ID Team Review 2006:

No amendment was undertaken as compliance with the National Historic Preservation Act was mandatory and that direction and guidance from the Forest Plan is consistent with the law. The Region has also established a Programmatic Agreement (PA) (1995) with the Advisory Council on Historic Preservation and Montana State Historical Preservation Office relative to management of cultural resource sites which further made an amendment to the Forest Plan unnecessary. A monitoring section was included in the PA in 2004 and 2005.

The Forest Archaeologist does not see a need for a Forest Plan amendment for cultural resources at this time as long as the Forest implements and follows direction given by the National Historic Preservation Act and the 1995 Programmatic Agreement with the Advisory Council on Historic Preservation and Montana State Historical Preservation Office is followed.

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### **Recommended Amendment 10: Research Natural Areas**

#### 1994 Five Year Review Recommendations:

The Five Year Review recommendation stated:

##### *“1. Management Area N*

The management area prescription should be reworded to allow the inclusion of new RNAs as they are established. Adjustments in the acreage of MA-N should be made through the annual Monitoring & Evaluation Report, as RNAs are established.

##### *2. Research Natural Area Target*

Forest manual direction for the establishment of RNAs does not preclude the need to fence areas to ensure protection. The Forest Plan standard was written prior to the Forest Service manual direction for RNAs.

None of these solutions would not constitute a significant amendment; rather, they would simply correct over-sights in the Plan and accommodate new policy direction. There is no real change in intent regarding RNAs. The need driving these changes is the expectation that all RNA system targets will be met within the 10 year timeframe of the Forest Plan.”

#### ID Team Review 2006:

Forest Plan Amendment 13 addressed the concerns noted in the Five Year Forest Plan Review regarding this item.



# Appendix A, Decision Flow Diagram

The following flow chart is from the Helena National Forest Plan, page IV/20.

