

HELENA NATIONAL FOREST

# **ANNUAL MONITORING REPORT**

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FISCAL YEAR 2004

March 2007



# TABLE OF CONTENTS

<b>INTRODUCTION.....</b>	<b>1</b>
FOREST PLAN MONITORING .....	1
YOUTH FOREST MONITORING PROGRAM (YFMP).....	1
<b>MONITORING REPORTS .....</b>	<b>3</b>
<b>(A) RECREATION .....</b>	<b>3</b>
(A1) DEVELOPED RECREATION .....	3
(A2) DISPERSED RECREATION.....	5
(A3) ORV COMPLIANCE AND DAMAGE .....	7
(A4) MEASURE CHANGE IN STATUS OF ROADLESS ACRES .....	9
(B1) WILDERNESS .....	10
<b>(C1-C9) WILDLIFE.....</b>	<b>17</b>
(C1) UNGULATE DISTRIBUTION, MOVEMENT, POPULATION STRUCTURE AND DENSITY. (ELKHORNS).....	17
(C2) UNGULATE HABITAT EVALUATION (ELKHORNS) .....	18
(C3) EFFECTS OF LAND USE ACTIVITIES ON UNGULATE POPULATIONS (ELKHORNS) .....	19
(C4)ELK AND DEER HABITAT SUITABILITY, INDICATOR SPECIES .....	21
(C5) BIGHORN SHEEP HABITAT SUITABILITY, INDICATOR SPECIES .....	22
(C6) GRIZZLY BEAR HABITAT EFFECTIVENESS, INDICATOR SPECIES .....	23
(C7) OLD GROWTH HABITAT (INDICATOR SPECIES PILEATED AND HAIRY WOODPECKERS AND GOSHAWK).....	25
(C8) MATURE CONIFER SUITABILITY, INDICATOR SPECIES.....	26
(C9) RIVER AND LAKE SYSTEM SUITABILITY, INDICATOR SPECIES (BALD EAGLE).....	27
ADDITIONAL WILDLIFE MONITORING .....	29
<b>(C10-C11) WILDLIFE AND FISH.....</b>	<b>42</b>
(C10) POOLS FORMED BY INSTREAM DEBRIS, INDICATOR SPECIES .....	42
(C11) INTRA-GRAVEL SEDIMENT .....	44
(C12) STREAMSIDE COVER FOR FISH .....	46
(C13) AQUATIC INVERTEBRATE POPULATIONS .....	49
<b>(D) RANGE/TIMBER, RANGE, RANGE/ROAD MAINTENANCE/TIMBER.....</b>	<b>50</b>
(D1.1) UTILIZATION OF FORAGE IN TRANSITORY RANGE .....	50
(D1.2) PERCENT OF AVAILABLE FORAGE UTILIZED BY LIVESTOCK .....	50
(D2) ALLOTMENT MANAGEMENT PLANNING AND UPDATE .....	51
(D3) WEED INFESTATIONS.....	51
(D4) CONDITION AND TREND OF RANGE AND FORAGE AVAILABILITY .....	64
(D5) PERMIT COMPLIANCE .....	65
<b>(E) REGULATED VOLUME, TIMBER .....</b>	<b>66</b>
(E1) REGULATED VOLUME PREPARED FOR SALE.....	66
(E2) TIMBER ASSUMPTIONS .....	67
(E3) SILVICULTURAL ASSUMPTIONS AND PRACTICES .....	69

(E4) FIREWOOD REMOVAL .....	70
(E5) SIZE OF OPENINGS.....	71
(E6) REGENERATED YIELD PROJECTIONS.....	72
(E7) REFORESTATION PRACTICES AND ASSUMPTIONS .....	73
(E8) TIMBER STAND IMPROVEMENTS AND ASSUMPTIONS .....	74
(E9) LANDS SUITABLE FOR TIMBER PRODUCTION .....	75
<b>(F) SOIL AND WATER .....</b>	<b>76</b>
(F1) COMPLIANCE WITH LOCAL, STATE, AND FEDERAL WATER QUALITY STANDARDS .....	76
(F2) SOIL AND WATER IMPROVEMENT PROJECTS .....	78
(F3) PRODUCTIVITY CHANGES IN SENSITIVE SOILS .....	79
(F4) AVAILABILITY OF ADEQUATE WATER TO MAINTAIN MANAGEMENT OPTIONS, WATER RIGHTS. ....	82
ADDITIONAL WATER AND SOIL MONITORING: POST FIRE ASSESSMENT .....	83
<b>(G) MINERALS.....</b>	<b>83</b>
(G1) FS LAND USES THAT MAY AFFECT MINERALS ACTIVITIES.....	83
<b>(P) PROTECTION.....</b>	<b>85</b>
(P1) ACRES AND VOLUMES IN INSECTS AND DISEASE INFESTATIONS .....	85
(P2) AIR QUALITY .....	87
(P3) FUEL TREATMENT OUTPUTS .....	88
(P4) WILDFIRE ACRE PROJECTIONS.....	88
(P5) COST OF SUPPRESSION, PROTECTION, ORGANIZATION, AND NET VALUE CHANGE.....	90
<b>(L) FACILITIES .....</b>	<b>91</b>
(L1-L2) ROADS/CONSTRUCTION AND ROAD MANAGEMENT .....	91
<b>HERITAGE RESOURCES.....</b>	<b>94</b>
HERITAGE MONITORING.....	94
<b>(T) ECONOMICS, ADJACENT LANDS, RESOURCES, AND COMMUNITIES, AND ALL RESOURCES .....</b>	<b>97</b>
(T1) ECONOMICS .....	97
(T2) ADJACENT LANDS, RESOURCES, AND COMMUNITIES .....	97
(T3) ALL RESOURCES, EFFECTS OF EMERGING ISSUES OR CHANGING SOCIAL VALUES .....	98
(T4) EVALUATE LANDS IDENTIFIED AS NOT MEETING PHYSICAL OR BIOLOGICAL CHARACTERISTICS.....	98

## 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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### Youth Forest Monitoring Program (YFMP)

#### Background

The Youth Forest Monitoring Program is a seven week summer internship for high school students who learn forest ecology and field techniques while providing additional monitoring of forest health for the Helena National Forest. The program, which began in 1998 with one field instructor and four students, expanded in 2004 to include two field instructors and eight students.

Partnerships and funding shifted in 2004 to include new partners Lewis & Clark County, Jefferson County, and Tri-County Resource Advisory Committee, as well as returning partners, Montana Discovery Foundation and University of Montana – Helena College of Technology. A new funding source from the counties was secured through Title II and Title III funding from the Secure Rural Schools Funding Act.

Three teams of YFMP students completed forest health monitoring activities at 29 sites in the Helena National Forest between June and August 2004. Site data, monitoring reports, and presentations are available for review at the Helena National Forest Supervisor's Office.

#### Weed Monitoring

Weed monitoring data was collected at 9 sites across the Helena National Forest: Heart Lake in the Scapegoat Wilderness, Hellgate Gulch, Magpie Gulch, Oregon Gulch, Oregon Gulch/M. Brown, Poorman's Creek, South Fork of Crow Creek 1, South Fork of Crow Creek 2, and Slim Sam. Most of these sites were newly established, such as the weed monitoring portion of Slim Sam, or recently studied within the last year such as Helgate Gulch, and the South Fork of Crow Creek Road.

Cover, frequency, and density data were taken using TERRA database format. Only the Heart Lake portion of the monitoring continued to utilize ECODATA collection format.

Four recommendations from the Weed Team include: (1) Continue to support biological control in the South Fork of Crow Creek Road areas. Weevils have successfully reduced live spotted knapweed from over 405 plants in a 50 square foot area. However dalmation toadflax continues to spread in the area. Yearly monitoring will be necessary. (2) Continue to monitor Magpie Gulch, where mustard took hold this summer and out competed many other plants, (3) Monitor how Hellgate Gulch continues to rehabilitate from heavy pesticide use in one small location – cheet grass is dominating one 20 square foot area where

spotted knapweed was eradicated by herbicide. (4) An increase in dandelions at the Heart Lake weed transects may indicate an increase in soil compaction, so continue to monitor these areas next year and confer with the Soil Team.

### Stream Monitoring

The YFMP Stream Monitoring Team collected data at 12 sites on the Helena National Forest. Only Slim Sam Creek was revisited from 2003. All other streams were last visited in 2001. Those in the 3-year monitoring rotation include: East Fork of McClellan Cr., Eureka Cr., Heart Lake in the Scapegoat Wilderness, Indian Cr., Jackson Cr., Keep Cool Cr., Magpie Cr., Nevada Cr., Sheps Cr., Slim Sam Cr., Swamp Cr., and Whites Cr.

Stream morphology was monitored through stream channel profile, stream bed composition through pebble count, and stream slope and sinuosity. Water quality data was collected in all streams with running water, with the exception of Heart Lake's outlet stream this year, which was dry. These tests include temperature, pH, dissolved oxygen, and conductivity. High quality hand-held data collection units replaced all Hach chemical kits this year, as they were successfully tested for accuracy in 2003, and the initiative to produce zero hazardous byproducts. Macroinvertebrate sampling was once again added to the toolbox of monitoring protocol, and compared to last year's collection data. Grazing, recreation use and mining were the top three impacts on monitored sites.

Recommendations offered by the Stream Team included: (1) Return in 2005 to determine if Heart Lake's outlet dries out every year, or is present longer on average, (2) As Sheps Cr. continues to improve as evidenced by a higher D50 rating of 8mm from .125mm in 2001, allow sustainable cattle grazing, (3) Utilizing all 3 teams (streams, weeds, and soils) at Slim Sam gave a broader picture of the status of this location's health. Return to this site for one more year with all three teams. (4) The cross section of the Whites Gulch indicated deeper incutting since 2001, so the team might want to revisit this location sooner than 2007 to keep an eye on the erosion, as well as an emerging spotted knapweed population located on the south side of Whites Gulch road near transect 1.

### Soil Monitoring

Soils monitoring data was collected by YFMP students at 8 sites on the Helena National Forest. These sites included Bullsweats Unit 9, Heart Lake in the Scapegoat Wilderness, Hellgate Gulch, Magpie Gulch, Oregon Gulch, Pikes Gulch, Slim Sam, and Trails Gulch. Except for Heart Lake, Magpie Gulch, and Slim Sam, all other areas were established in 2004 as new soil monitoring sites, although some sites like Slim Sam, may have already established weed monitoring as a precedent.

Monitoring protocol included soil structure analysis, soil color, soil temperature, vegetative cover, rooting depth, erosion rate, infiltration rate, and downed woody debris. Recommendations from the soil crew include: (1) At Heart Lake, block off the flat area adjacent to the beach, from overnight camping to address some alarming compaction taking place in this popular area, and to give vegetation an opportunity to recover, (2) Prescribed burns appear to be working in Trail Gulch and Bull Sweats Unit 9. There was a dramatic decrease in ladder fuels in adjacent area where prescribed burns were used as a management tool. (3) Continue to monitor Oregon Gulch, as infiltration tests appear to indicate a sharp decline in ground porosity, (4) Slim Sam appears to be recovering well from infiltration and rooting depth data. More flexible cattle rotation may be utilized.

Photopoints were established at each site as part of the data collection process.

## 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; monitoring closeness to capacities; and determining if developed facilities are maintained to existing capacity and standards.

##### Current Efforts & Findings:

##### *Monitoring Activity:*

The condition of developed recreation facilities is monitored through the Forest Service Infrastructure and Deferred Maintenance reporting system. 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 developed sites.

Fiscal year 2004 began a new five-year period of monitoring. Condition surveys were completed at all developed recreation sites on the Helena Forest during fiscal year 2004. Information regarding the condition of recreation facilities was documented in the INFRA database prior to the end of the fiscal year.

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

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

##### *Analysis:*

Condition survey information, documented in the INFRA database, is used to develop annual Operation and Maintenance Plans. That information is also utilized to identify and prioritize future capital investment projects. Based on that information, a reconstruction project was identified and scheduled for Vigilante Campground during fiscal year 2005.

The number of visitors is dependent largely upon local weather conditions and management actions on the Forest. Total recreation use at developed sites was lower during fiscal year 2004 because the Copper Creek Campground (D4) was closed due to safety concerns (post wildfire precautions).

Rental Cabins on the Forest were occupied a total of 651 nights during calendar year 2004. This represents an increase of approximately 7% from the previous year. Cabin rental information such as the

number of permits issued, number of nights occupied, number of people served, and revenues collected are documented annually.

#### Variability 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.

##### *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 and picnic areas) on the Forest. Changes have occurred within the developed recreation program over the past 20 years.

Pikes Gulch Campground on the Helena Ranger District was abandoned during the 1990's. During that same period, two new developed sites were constructed at Gypsy Lake (campground and picnic area). Seven facilities have also been added to the developed recreation program as rental cabins.

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

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

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

##### *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, 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.

NVUM data may not provide a fully accurate picture of RVD's on the Forest either. It is based on a 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 will likely redefine or change use figures on the Helena National 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 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.

Because sufficient funding is not available, developed recreation sites are not being maintained to full Meaningful Measures standards. The Forest should consider initiating a Recreation Site Facility Master Plan to help establish priorities within the developed recreation program.

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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.

*Intent:*

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

**Current Efforts & Findings:***Monitoring Activity:*

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

The primary effort to monitor and evaluate the Recreation Opportunity Spectrum in 2004 was the continuation of the North Big Belts Travel Planning process. In an effort to ensure that a variety of recreation opportunities are provided in the North Big Belts, six alternatives were analyzed in the FEIS (Final Environmental Impact Statement).

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 has not yet been entered into the Infra database.

Visitor use information obtained during fiscal year 2003 through the National Visitor Use Monitoring Project was provided to the Helena Forest in 2004. 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.

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.

*Analysis:*

Recreation use information obtained through the National Visitor Use Monitoring Project does not provide specific use figures for any one area of the Forest. However, the survey information, along with traffic counts, is a helpful tool for future recreation planning. Traffic counts, from exit locations on the Forest, do provide a snapshot of recreation use occurring in the area. Public comments provided during the survey indicate an average or better satisfaction rating for recreation on the Forest.

**Variability Discussion:**

*Variability Measures:*

Forest Plan Monitoring Requirements state that a 25% variation in the projected base by ROS type should be documented. The table below 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.

*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 Includes Roaded Modified & Rural	408,000	306,000 – 510,000	503,157

*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. 1986 ROS classifications are 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.

**Recommended Efforts:**

The dispersed recreation site information from the GFA condition surveys should be entered into the Infra database during 2005. This information will be helpful in identifying resource concerns and work priorities. In the future, any changed conditions at dispersed sites should be routinely updated as necessary. Utilize GFA condition surveys to identify deferred maintenance needs and annual program of work.

The Forest should make a final North Big Belts Travel decision and begin implementation in 2005.

The Forest should review National Visitor Use Monitoring Project data collected on the Helena Forest during 2003. Base future recreation plans, in part, on information obtained through the 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 nationally.

ROS classifications should be reviewed and verified within the next five years. It's anticipated this would occur in coordination with Forest Plan Revision.

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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 meets assigned prescriptions of the Forest Plan.

#### **Current Efforts & Findings:**

#### *Monitoring:*

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 seem to indicate that OHV problems on the Helena Forest increased during fiscal year 2004. There were 18 Violation Notices issued for OHV related incidents in 2004 compared with 6 the previous year. There were 66 Incident/Warning Reports documented for OHV related incidents in 2004 compared with 43 the previous year. The noted increase could be a result of several factors including the increased presence of Forest officers in the field.

It's likely OHV violations occur in many areas of the Helena Forest. However, there were several areas where OHV violations were especially prevalent and noted during fiscal year 2004. Forest employees identified the following areas where OHV violations seemed to increase:

Clancy/Unionville

East side of the Elkhorn Mountains

Telegraph Creek/Little Blackfoot Area

North Big Belts

In response to resource damage resulting from OHV use, portions of lower Beaver Creek were closed to motorized use on the Helena Ranger District. The scope of the damage was great enough the District felt they couldn't wait for the North Belts Travel decision and closed the area during the spring of 2004.

#### *Analysis:*

Existing OHV use does impact natural and cultural resources on the Forest, although the severity of damage is highly subjective. Resource impacts resulting from OHV use have diminished since July 1, 2001 when off-route motorized travel was prohibited. 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 may result from the growing popularity of OHV use and the reduced opportunities for OHV use on public lands. Motorized sport riding results in some limited impacts to designated Forest trails.

OHV problems that occurred in 2004 were similar to those occurring in the past. Some individuals continue to drive OHV's cross-country or on roads closed to motorized travel. The primary OHV violations identified on the Helena Forest include:

- Motorized travel on roads where motorized use has been prohibited.
- Motorized travel off roads.
- Motorized travel on trails where motorized use has been prohibited.
- Off-route motorized use resulting in land and/or resource damage.

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.

#### Variability 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.

##### *Monitoring Results:*

The primary method utilized to track OHV impacts has been Forest travel planning. Additional, special orders can and are implemented to address OHV problems in specific areas.

A travel plan decision for the Clancy-Unionville area was signed on February 12, 2003. The associated environmental impact statement did address OHV impacts and provided rationale for changes and additional travel restrictions.

On May 12, 2004 unclassified roads adjacent to Beaver Creek (D2) were closed to motorized travel in response to unacceptable resource impacts.

##### *Assessment:*

Updated travel plan decisions and implementation of site specific Closure Orders do address critical OHV problems. Unfortunately the Forest has been unable to complete travel planning as projected. Until travel planning is completed on the Forest, OHV problems will continue to occur in certain areas.

#### Recommended Efforts:

In an effort to reduce OHV violations and impacts, travel planning should be completed in a timely manner. Following travel plan revisions, the Forest visitor map should be simplified to facilitate better understanding of Forest travel restrictions. The Forest should emphasize implementation of new travel plan decisions with improved signing and increased field presence to ensure compliance.

A renewed emphasis should be made on each Ranger District to document and track OHV violations, user conflicts and resource damage.

Forest Service personnel should limit their OHV use to that deemed absolutely necessary. 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.

The Forest should continue implementation efforts on existing travel plan decisions.

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

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

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

The Forest Plan requires measuring the amount of change in the status (character) 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. Project plans, NEPA documents, watershed analysis, and transportation analysis should be monitored to compare acres and distribution of Inventoried Roadless resources with that projected in the Forest Plan.

##### **Current Efforts & Findings:**

##### *Monitoring Activities:*

Forest projects that may affect Inventoried Roadless resources (size and characteristics) are evaluated in compliance with NEPA regulations.

##### *Analysis:*

No decisions were made or implemented in 2004 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.

##### **Variability 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 elements has terminated, the Forest will continue to track and monitor changes to Forest Inventoried Roadless resources.

##### *Monitoring Results:*

The 1986 Forest Plan identified a total of 369,000 acres of Inventoried Roadless. Identified in the table below is a list of the specific Inventoried Roadless Areas and acreage figures.

<b>Area #</b>	<b>Area name</b>	<b>Roadless 1983 Re-Inventory</b>	<b>Change</b>	<b>Reason for Change</b>
F1485	Silver King-Falls Creek	7,200		
A1485	Bear-Marshall- Scapegoat-Swan	51,500	8	Timber sale

Area #	Area name	Roadless 1983 Re-Inventory	Change	Reason for Change
1601	Lincoln Gulch	8,100	89	Timber sale
1602	Anaconda Hill	17,500		
1603	Specimen Creek	11,300		
1604	Crater Mountain	9,000	300	Private land
1605	Ogden Mountain	12,100	239	Timber sale
1606	Nevada Mountain	49,500	5	Timber sale
1607	Jericho Mountain	9,000	28	Timber Sale
1608	Lazyman Gulch	11,900		
1609	Electric Peak	27,500		
A1610	Holter	1,700		
W1610	Big Log	9,900		
1611	Devils Tower	7,000		
1612	Middleman Mountain	22,800	210	Timber sale
1616	Camas Creek	28,300	1,915	Timber sale & Recreation project
1617	Mount Baldy	16,100	100	Recreation project
1618	Grassy Mountain	6,400	190	Timber sale
1619	Ellis Canyon	8,600	5,185	2 Land exchanges
1621	Irish Gulch	7,300		
X1613	Hedges Mountain	10,100		
X1614	Hellgate Gulch	18,200		
X1615	Cayuse Mountain	18,600		
	Total	369,600	8,269	

**Assessment:**

Since 1983, approximately 8,269 acres of Roadless Areas on the Helena National Forest may have been impacted by administrative actions. Those impacted areas are well within the 20,000 acre variation identified within established Forest Plan Monitoring guidelines.

**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 Roadless Areas through environmental analysis of project proposals.

**(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.

**Current Efforts & Findings:***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. Informal observations by Forest Service employees indicate that visitor use within both wilderness areas has generally remained the same.

*Scapegoat*

The wilderness ranger and trail crew foremen monitored conditions on approximately 50 miles of trails within the Scapegoat Wilderness. In addition, condition surveys were accomplished and documented on 40 miles of trails within the Scapegoat. Trail crews cleared an average of 31 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 47 sites in the Scapegoat during 2004 using the Limits of Acceptable Change (LAC) protocol (Revision 3, April 2003 form). Three new campsites were noted and inventoried. Preseason and operating season inspections (following LAC protocols) were completed on all outfitter camps in operation during in 2004.

Visitor encounters were primarily documented during fall hunter patrols. Approximately 175 miles of patrol were completed in 25 days, resulting in 20 camp contacts and 50 trail contacts. Noted violations include: two warnings issued for Food Storage violation; one camp in violation of the Occupancy and Use order; and one violation notice issued for mechanized (chainsaw) tool use. A total of 60 person days were spent in the wilderness in fiscal year 2004 patrolling, clearing trail, visiting camps, and conducting LAC inventories.

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

*Gates of the Mountains*

The Helena Ranger District's 4-person trail crew cleared all 52.3 miles of trail located within the Gates of the Mountains Wilderness. The crew spent a great amount of time clearing and reopening the Willow Creek trail and accomplishing deferred maintenance work on the Big Log Gulch, Refrigerator, and Meriwether Canyon trails. Condition surveys were completed on 50.5 miles of trails during 2004. All trailhead signboards were updated with new posters and current visitor information.

Hunter patrols were conducted during the fall hunting season. One abandoned hunting camp was discovered and dealt with during that time. While on patrol, a Forest employee identified an unauthorized memorial located in the Kennedy Springs Area that will need to be addressed.

*Analysis:*

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.

Although self-registration stations are only maintained at the Indian Meadows and Alice Creek Trailheads (both portals to the Scapegoat), the percentage of visitors registering is low. As a result, there is no visitor use data specific to either wilderness on the Helena Forest.

#### Variability Discussion:

##### *Variability Measures:*

Forest Plan Monitoring requirements state that a 20% deviation from management plans is acceptable.

##### *Trail conditions*

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

Trail Condition 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*

Because visitor use was limited, an appropriate number of trail encounters was never established for the Gates of the Mountains Wilderness. However, it can be assumed that the number of encounters should generally meet established ROS criteria for primitive and semi-primitive areas (less than 15 encounters daily). The management plan for the Gates does require monitoring recreation use via ranger observations.

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 levels of encounters are very infrequent.

Opportunity Class II – general levels of encounters are low.

Opportunity Class III – general levels of encounters are moderate.

Opportunity Class IV – general levels of encounters are moderate to high.



### Range Conditions

There is one current grazing allotment authorized within the Gates of the Mountains Wilderness (Moors Mountain). The overall range and forage condition within the Gates are monitored but not on a routine schedule.

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

### Trend and actual use levels

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

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

### Campsite impacts

The management plan for the Gates states, "minimize person-caused change to the wilderness character due to fire suppression and recreational activity by adopting the limits of acceptable change (LAC) concept.

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

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

#### Trail conditions

Condition surveys for wilderness trails are completed every five years and documented within the Infra database. Most of the Gates trails are maintained annually. HNF FP monitoring requirement for measurement and frequency of Wilderness (B1) is annual, 25% of heavy use areas and trails. In the Scapegoat Wilderness, Opportunity Class IV trails are managed to accommodate heavy traffic and there are approximately 17 miles of trail in OC IV. In fiscal year 2004, 100% (17 miles) of these trails were cleared to standard, and 70% (12 miles) of these trails were maintained to standard.

#### Visitor encounters

There is little or no evidence that visitor encounters exceed existing ROS standards for primitive and semi-primitive non-motorized areas. Based on the input provided by Forest employees and visitors, there are seldom more than 15 encounters per day at even the most popular areas.

In the Scapegoat, visitor encounters were primarily documented during fall hunter patrols. Approximately 175 miles of patrol were completed in 25 days, resulting in 20 camp contacts and 50 trail contacts. Noted violations include: two warnings issued for Food Storage violation; one camp in violation of the Occupancy and Use order; and one violation notice issued for mechanized (chainsaw) tool use. A total of 60 person days were spent in the wilderness in fiscal year 2004 patrolling, clearing trail, visiting camps, and conducting LAC inventories. The probabilities of encounters and general level of encounters were within standard for all four Opportunity Classes in fiscal year 2004.

### Range conditions

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 overall range condition within the Gates of the Mountains Wilderness is also considered to be in good condition.

The range condition in the Scapegoat Wilderness (pack and saddle stock only) is generally in good condition and does not exceed a moderately grazed appearance. Also, at campsites, range condition is incorporated into condition class result, which is reported below in the campsite trend bullet.

### Trend and actual use levels

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

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

### Campsite impacts

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

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): general trend is a slight increase in impacts. Bighorn Lake has seen some recovery. Valley of the Moon has a few sites that have recovered but has at least two sites with very heavy impact and regular use.

Middle Fork, Crow Creek (Geo unit 5-2-1): general trend as reflected from the database is static. This drainage receives a lot of regular use and there are two to five moderate to heavy sites in the Middle Fork and two heavy sites in the upper reaches of the drainage near Chap's Gap.

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

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

Meadow Lake (Geo unit 5-5-1): general trends at Meadow Lake show an increase in impacts. The peninsula/shoreline has 3-5 sites with heavy impact within a small vicinity. This area is currently out of standard for the opportunity class. Management plans, such as a livestock restriction and campsite rehab, are being considered.

Alpine parks, Arrastra and Dry Creeks (Geo unit 5-5-2): general trends are beginning to increase. Starting in 2003, there was a major increase in camping activity and 5-10 sites that show moderate to heavy impacts. A forest closure due to wildfire occurred in 2003 and many hunters were displaced to this area.

Webb Lake, Parker Lake, Sourdough (Geo unit 5-6-1): general trend is static. There is a noted decrease in impacts and substantial recovery at Parker Lake.

Heart Lake, Landers Fork (Geo unit 5-7-1): general trends in this area are static to increasing. There are several moderate to heavy impacted sites at Heart Lake. 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 its 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.

**Recommended Efforts:**

Trail condition surveys should continue to be accomplished within the Gates and Scapegoat on a five-year interval and entered into the Infra database to update the deferred maintenance needs. The five-year interval for condition surveys is usually sufficient to identify changed conditions and critical maintenance needs.

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 Draft 10-Year Wilderness Challenge Action Plan. Within funding limitations, the Forest must determine which elements are of the highest priority for implementation.

Ranger observations made within the Gates of the Mountains Wilderness occurs primarily on weekdays and does not provide insight into visitor use on weekends and holidays. The Forest should consider gathering baseline data that could be used for the establishment of carrying capacity.

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

**Other Monitoring Efforts:**

In 2004, Region One developed a 10-Year Wilderness Challenge Draft Action Plan for the R1 Wilderness Program. The plan was prepared to determine if Region One Wilderness Areas were being managed in compliance with BFES (Budget Financial Execution System) standards. 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 – not meeting the BFES standard

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

Scapegoat – meeting the BFES standard

Gates of the Mountains - meeting the BFES standard

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

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

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

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #6 – Wilderness completed recreation site inventory.

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

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

Scapegoat – meeting the BFES standard

Gates of the Mountains – meeting the BFES standard

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

Scapegoat – meeting the BFES standard

Gates of the Mountains – not meeting the BFES standard

Element #9 – The priority information needs for 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

### (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.

#### Data Sources:

Tom Carlsen maintains reports at the Townsend Field Office of FWP; the 2004 annual survey (elk) memo is on file at the Supervisor's Office.

#### Current Efforts & Findings:

##### *Monitoring Activity:*

Aerial elk surveys were conducted in the Elkhorns in 2004. Information on other ungulate species has been requested from Montana Fish, Wildlife, and Parks and will be used in subsequent monitoring reports.

##### *Analysis:*

A total of 1,811 elk were observed which is an increase of 326 elk (N=1485) over last year's survey. Elk were using more of their traditional winter ranges than in most years. Calf ratios were lower, presumably due to drought. Bull elk made up about 11% of the total (the objective is 10%). About 77% were brown-tinted bulls (objective is 50%). The average bull age was 5.7 years. Management of elk numbers has been geared towards landowner tolerance of elk on private lands. Input to the new Elk Plan was done by the Elkhorn Working Group with technical assistance from the Helena NF.

#### Variability Discussion:

##### *Variability Measure:*

±10% from previous measurements

##### *Monitoring Results:*

The analysis indicates that the total number of elk observed in 2004 increased approximately 22% over the previous year's survey. The structure of the inventoried elk also is above FWP objectives.

##### *Assessment:*

Land management activities are not resulting in negative consequences elk based on aerial survey data. Trends in animal numbers are increasing and variations in herd structure are above objectives. The above monitoring results indicate that elk are experiencing positive trend increases relative to the variability measure.

#### 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.

### Data Sources:

Ecosystem Research Group (ERG) produced 2 reports that look at habitat and range conditions for the North Crow and Kimber Elk Herd Units. They are available on their website and on file in the Supervisor's Office: ([http://www.ecosystemresearchgroup.com/elkhorn\\_working\\_group.html](http://www.ecosystemresearchgroup.com/elkhorn_working_group.html)).

The Elkhorns Fire History Report is on file in the Supervisor's Office.

### Current Efforts & Findings:

#### *Monitoring Activity 1:*

Habitat and range conditions were analyzed by ERG as part of a collaborative effort to determine elk/livestock interactions in the Elkhorns. Information on other ungulate species has been requested from Montana Fish, Wildlife, and Parks and will be used in subsequent monitoring reports.

#### *Analysis 1:*

This is year 1 of 2 for data collection on utilization levels by cattle and elk and production and condition of the range. For the North Crow elk herd unit, comparing 2 sets of data, ERG concludes, "rangeland habitats in the North Crow Allotment are in acceptable condition". On southwest slopes, conifer colonization and noxious weeds are problems, and these sites are used by elk and by cattle. Based on populations, forage use on both elk herd units (by elk and cattle) peaked in 1996 and decreased by 37% (Kimber) and 12% (North Crow) in 2003. Production in 2004 was estimated to be about 65% of normal based on range site descriptions.

ERG determined that elk are congregating in areas grazed by cattle the previous fall and that elk population trends are influenced by precipitation patterns. They recommend elevating and increasing weed control efforts, developing a forage projection index to plan for ungulate use, reducing conifer colonization, and changing season of use and other methods for improving cattle distribution.

#### *Monitoring Activity 2:*

Steve Barrett was the contractor awarded a fire history characterization for the east flank of the Elkhorn Mountains. He sampled fire-scarred trees at 97 sites (183 fire-scar cross-sections) and determined forest cover type and habitat type on a 375 meter sq plot to develop master fire chronologies and landscape scale fire patterns. These in turn were used to develop several maps, including fire regime condition classes.

#### *Analysis 2:*

Results suggested that fires occurred in every decade between 1700 and the present. After 1900, plot fire records declined to one percent or less. After 1940, 12 of 105 fires developed into spreading fires, burning a total of about 8,500 acres. Aerial photos suggest that large stand replacing fires rarely occurred in the study area before 1900, but rather the historical pattern was of low-and mixed severity fires.

The fire frequency curve for the Elkhorns contains a number of peaks and valleys as a result of climatic trends and other factors. There was substantial fire activity during the drought that occurred during the

mid-to late 1800's. Heavy grazing and fire suppression caused the steep decline in fire activity during the 1900's. Intervals between consecutive fires in xeric Douglas-fir historically averaged 15-20 years and it has been over 80 years since the last fire; in mesic Douglas-fir, mean fire interval ranged between 20-30 years with 110 years since the last fire. In the lower subalpine fir forest, mean fire interval was between 40-60 years with highly variable intervals from 25-100 years long. The current fire interval averages about 120 years long.

Sagebrush occupies about 10% of the area with a mean fire interval of 17 years with frequent mixed severity fires historically. In the Mountain grassland and sagebrush types, an average of about 2400 acres per year would have burned historically. In contrast, the post-1940 fire data suggest an average of just 129 burned acres per year even when factoring in prescribed burning.

Nearly a century of fire exclusion on the Douglas-fir forests have resulted in stand infilling, reduced stand biodiversity, reduced diversity of the forest age class mosaic, increased fire severity potential, and forest encroachment into adjacent grasslands and shrublands. A nearly threefold increase in the amount of closed canopy forest during the fire exclusion period has occurred at the expense of grasslands, shrublands, and previously open tree stands.

#### Variability Discussion:

##### *Variability Measure:*

±10% from previous measurements

##### *Monitoring Results:*

ERG measured habitat and range conditions in the North Crow and Kimber Herd Units in the Elkhorns (Monitoring Activity 1). Preliminary data indicate forage use has declined by elk since 1998 in both of these Herd Units. Conifer encroachment and noxious weed infestations as well as precipitation patterns appear to be affecting forage availability. The fire history study in the Elkhorns (Monitoring Activity 2) indicates that grass and shrublands have declined over historic conditions due to fire suppression.

##### *Assessment:*

The primary agents responsible for current conditions in portions of the Elkhorns include fire suppression, noxious weed invasions, and precipitation patterns. Traditional foraging habitat has been lost as a result of these agents. However, small patches of hiding and thermal cover now occupy portions of the landscape in areas of conifer encroachment. The ERG Final Report is anticipated in 2006. Data from that study will be used to determine whether we are within the acceptable variation for this monitoring element.

#### Recommended Efforts:

No recommendations at this time.

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

#### Forest Plan Requirements:

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

## Data Sources:

Ecosystem Research Group (ERG) produced 2 reports that look at habitat and range conditions for the North Crow and Kimber Elk Herd Units. They are available on their website and on file in the Supervisor's Office: ([http://www.ecosystemresearchgroup.com/elkhorn\\_working\\_group.html](http://www.ecosystemresearchgroup.com/elkhorn_working_group.html)).

## Current Efforts & Findings:

### *Monitoring Activity:*

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

### *Analysis:*

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

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

## Variability Discussion:

### *Variability Measure:*

±10% from previous measurements

### *Monitoring Results:*

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

### *Assessment:*

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

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

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



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

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

**Recommended Efforts:**

No recommendations at this time.

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

**Forest Plan Requirements:**

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

**Data Sources:**

Reports, data, and metadata are available at the Supervisor's Office.

**Current Efforts & Findings:**

*Monitoring Activity:*

The amount of cover, based on updated master vegetation, was analyzed to estimate cover and forage for elk and new road construction and road decommissioning was analyzed to determine open road densities.

*Analysis:*

The analysis indicates that in 2004 there were approximately 128,826 acres of forage habitat forest-wide and 203,501 acres of cover forest-wide.

Open road densities for 2003 forest-wide by the applicable management areas were 0.8 miles/square mile.

**Variability Discussion:**

*Variability Measure:*

-10% from previous measurements

*Monitoring Results:*

The analysis of the forage/cover condition in 1988 indicates that at that time there were approximately 113,542 acres of forage and 218,839 acres of cover. The comparison of current cover and forage estimates with those derived for 1988 indicate that forage has increased by 12% since 1988 and cover has decreased by 9%.

Open road densities were estimated for 1991 at 1.1 miles/square mile. The changes between 1991 and 2003 indicate a reduction in road densities of 25%.

*Assessment:*

Based on the above monitoring results, the Forest is within the acceptable variation for this monitoring element.

**Recommended Efforts:**

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

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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.

**Data Sources:**

Aerial survey reports are on file with local Fish, Wildlife, and Parks Offices.

**Current Efforts & Findings:***Monitoring Activity:*

The HNF relies on bighorn sheep surveys by Montana Fish, Wildlife, and Parks (MFWP) and has not conducted independent surveys in recent years. Aerial surveys of elk and deer winter range (also conducted by MFWP) do not target bighorn sheep but may pick them up if they are present.

*Analysis:*

Aerial surveys did not locate any bighorn sheep in the Helena National Forest portion of the Divide landscape in 2004 (none have been observed during winter flights over several decades—although a transient ram was reported by ground observers in the Clancy Creek area in 2002).

Bighorn sheep were reintroduced onto Bureau of Land Management (BLM) managed lands in the northern Big Belt Range in the 1990s. They were at first confined to BLM and State managed land north and west of the National Forest, but have since extended their range onto the Forest. At this point they are limited almost entirely to the Gates of the Mountains Wilderness Area, where suitable habitat is readily available. Habitat management opportunities are limited in this area due to its wilderness status and will primarily include wildfire and wildland fire use activities.

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

-10% from previous measurements

**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.

**(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.

**Data Sources:**

Reports are on file at the Supervisor’s Office

**Current Efforts & Findings:**

*Monitoring Activity:*

Road densities for the Northern Continental Divide Ecosystem (NCDE) were analyzed for preparation of the Biological Assessment for Grizzly Bears inside the Northern Continental Divide Ecosystem and in the Grizzly Bear Distribution Zone.

*Analysis:*

The following table summarizes road densities within the three grizzly bear subunits within the NCDE on the Helena National Forest.

<b>Road Densities per the Forest Plan Standards</b>	
Subunit	Existing Condition (Standard = 0.55 mi/sq. mi)
Red Mountain	0.36
Arrastra Mountain	0.47
Alice Creek	0.14
Total (cumulative effect area)	0.34

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 (<75% FS mgt) (% of area meeting guideline)	15.8	19.5	74.8
Arrastra Mountain (% of area meeting guideline)	14.6	16.5	74.5
Red Mountain (% 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.

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

-10% from previous measurements

*Monitoring Results:*

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 derived for the BA referenced above were compared with those calculated for the 1987 Monitoring Report. The data for the BA are from 1992 through 2003. No new roads have been built in 2004. Road building and decommissioning from 1988 through 1991 did not occur in this area.

The following table indicates that over the past 13 years, the Forest has decommissioned more roads than have been constructed (approximately 1.1 miles).

<b>New Roads Constructed and Roads Decommissioned on the Helena National Forest within the NCDE Recovery Zone</b>		
Year	New Road Construction (Miles)	Roads Decommissioned (Miles)
1992 - 1996	0	0
1997	0.4	0
1998	2.6	2.6
1999 - 2001	0	0
2002	0	1.5
2003	0	0
Total	3.0	4.1

Open road densities in 2004 are 0.34 miles/square mile. Habitat effectiveness in 2004 is approximately 96%.

*Assessment:*

The following table compares 1987 road densities and habitat effectiveness with 2004. Based on this analysis, the -10% variability that would initiate actions has not been reached. Both open road densities and habitat effectiveness have improved between 1987 and 2004.

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

**Recommended Efforts:**

The Cumulative Effects Model (CEM) should be used to determine changes in habitat effectiveness.

## (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. Although this monitoring element is only applicable to Management Areas M1, H1, H2, R1, T1-T5, W1, W2, and E1-E4 (Page III/96, Forest Plan), Forest-wide data are provided in this report.

### Data Sources:

These data are documented in the report "Detailed Estimates of Old Growth by Landscapes on the Helena National Forest" May 28, 2004 and is on file in the Supervisor's Office.

### Current Efforts & Findings:

#### *Monitoring Activity:*

Forest Inventory and Analysis (FIA) data were used to determine old growth acres Forest-wide. The Forest Inventory and Analysis (FIA) Program is a nationwide grid designed to collect and analyze data on forested lands across all ownerships. Data collection occurs across a 5000 meter grid. Nearly 120 variables are collected at each location. The Helena National Forest has 150 FIA plots that had been established in 1996. One hundred thirty-nine of those plots are forested land while the remaining eleven plots are non-forest land or water.

Based on the FIA random sampling grid, confidence intervals are calculated for all analyses. Data are not represented with specific spatial locations but are related to various land masses, such as the Forest boundary or landscape analysis areas.

#### *Analysis:*

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

The following table displays estimates of Forest-wide old growth by landscape (from Bush and Zeiler, 2004, Detailed Estimates of Old Growth by Landscapes on the Helena National Forest).

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

### Variability Discussion:

#### *Variability Measure:*

-10% from previous measurements

*Monitoring Results:*

As indicated above, ten percent of the FIA survey points are remeasured annually. As these re-measured plots accumulate, FIA data will be periodically updated.

*Assessment:*

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.

**Recommended Efforts:**

This monitoring item, old growth habitat, identifies in parentheses the indicator species pileated woodpecker, goshawk, and hairy woodpecker. The hairy woodpecker should not be considered part of this element since it is not an old growth associated species. Hairy woodpeckers reside in many forest communities and utilize a variety of tree sizes. They feed on insects, primarily ants, wood borers, and grubs as well as fruits and berries. Hairy woodpeckers forage on a variety of substrates including snags and down logs. They may concentrate in areas of insect outbreaks in response to the increased food source (Sousa 1997<sup>2</sup>). This species is a fire-adapted species associated with habitat that is characterized by recurring fires of various intensities. As originally identified on page II/17 of the Forest Plan, the hairy woodpecker is an indicator for a snag dependent species. Therefore, we recommend removing reference to the hairy woodpecker from this old growth monitoring element. This does not change the monitoring required or that has been done.

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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.

**Data Sources:**

The documentation and reports for data and methodologies referenced below are on file at the Supervisor's Office. See also Winter Track Surveys below, under Additional Wildlife Monitoring Elements.

**Current Efforts & Findings:***Monitoring Activity:*

Forest Inventory and Analysis (FIA) data were used to determine marten habitat Forest-wide. See discussion under C7 regarding FIA.

The Timber Stand Management Record System (TSMRS) was also used to estimate marten habitat Forest-wide.

*Analysis:*

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

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<sup>2</sup> Sousa, P.J. 1987. Habitat suitability index models: hairy woodpecker. U.S. Fish Wildl. Serv. Biol. Rep. 82 (10.146). 19 pp.

the Helena National Forest has a mean of 24.3% with a lower limit of 19.6% and an upper limit of 29.2% (90% confidence interval). The table below identifies mature (marten) habitat by landscape.

<b>Marten Forest Habitat by Landscape (Source FIA Data)</b>	
Landscape Area	Marten Habitat (Acres)
Big Belts	82,808
Elkhorns	10,771
Divide	47,190
Blackfoot	56,823
<b>TOTAL</b>	<b>197,593</b>

#### Variability Discussion:

##### *Variability Measure:*

-10% from previous measurements

##### *Monitoring Results:*

As indicated above under C7, ten percent of the FIA survey points are remeasured annually. As these re-measured plots accumulate, FIA data will be periodically updated.

##### *Assessment:*

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.

#### Recommended Efforts:

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

### **(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.

#### Data Sources:

Reports of nest and habitat surveys are available on file at the Helena and Lincoln Ranger Districts.

#### Current Efforts & Findings:

##### *Monitoring Activity:*

The nest at Fields Gulch was monitored by Forest Service personnel. Portions of the Little Blackfoot River corridor (from U.S. Highway 12 southward to the confluence of Ontario Creek) were also surveyed for active bald eagle nests.

##### *Analysis:*

The Fields Gulch nest was observed in early July. Nestlings were present. The Fields Gulch nest has moved from the upper half of the Gulch to a new location closer to the Missouri River. No new nests were

identified but the number of eagles observed in the Gates of the Mountains section of the Missouri this year suggests that another nest may have been established in that area.

Surveys in the Little Blackfoot River Corridor were extensive, rather than intensive, and focused on sites that appeared to have the highest potential for supporting eagle nests. These field checks were in response to eagle sightings in the Elliston area. However, no eagle nest was found. After two years of perusal of the upper Little Blackfoot with no results, it seems likely that the birds seen along the River near Elliston belong to the long-established nest at Lois Lake in the Snowshoe Creek drainage to the northeast or to an unidentified nest off the Forest lower on the Little Blackfoot.

#### Variability Discussion:

##### *Variability Measure:*

Any loss of an eagle nest

##### *Monitoring Results:*

Surveys conducted in FY03 indicated that the Field's Gulch nest was active. There are additional bald eagle nests in the vicinity (Cochran Gulch and Hauser Dam). However, these are not on the Helena National Forest. The Cochran Gulch nest was on Forest prior to 1999. In 1999, the eagles moved the nest across the Missouri River to public lands managed by the Bureau of Land Management. There has been no loss of an eagle nest.

##### *Assessment:*

There is no unacceptable deviation from past measurements.

#### 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.

#### Additional Monitoring Efforts related to this Element:

##### *Monitoring Activity:*

One bald eagle nest is monitored annually within the Blackfoot Landscape. This nest is located on private land adjacent to the Blackfoot River near Beaver Creek. No other nests are known for the Blackfoot Landscape. Wintering bald eagles are also noted in the Blackfoot river corridor annually.

##### *Analysis:*

The Beaver Creek eagle nest has been active for several years although reproduction was not monitored in 2004.

#### Recommended Efforts:

As program funding and priorities allow, continue annual monitoring of the Beaver Creek nest for reproductive success. 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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### Flammulated Owls

Location and evaluation of suitable habitat, and surveys for presence/absence of the birds in identified habitat patches were monitored. The report is available on file at the Helena Ranger District (contact Brent Costain).

#### Monitoring Activity:

The Mt Helena Ridge (along the route of the National Recreation trail) was surveyed for suitable flammulated owl habitat in March, and the potential habitat patches were then surveyed for owl presence twice in May. Calling surveys were conducted around dawn at 9 stations along a 2.5 mile transect. This fieldwork was in response to a credible report of flammulated owl vocalizations in that area in 2003.

#### Analysis:

This year's fieldwork added to the number of mapped potential habitat patches along the Mt Helena Ridge. However, calling surveys did not elicit any responses. It is probable that survey timing (before and after dawn) was largely responsible for lack of response.

Because flammulated owls are insect-feeders, we normally do not begin to look for them until mid/late May. The Mt Helena ridge had not been surveyed in previous years because it did not appear to support much ponderosa pine old-growth habitat. Follow-up to the reported vocalization confirmed the presence of at least one owl in dense, small mature Douglas-fir forest on the northwest side of the ridge in 2003—not typical flammulated owl habitat. On the opposite side of the ridge was an array of open-grown ponderosa pine stands, dominated by old-growth sized trees with dense patches of younger conifers scattered underneath and in between. The pine stands (mostly at the heads of draws) were separated by open grassland and shrubland on the intervening ridges. This mosaic is not classic flammulated owl habitat but appears to contain all the elements needed to support nesting pairs. It was hypothesized that the owls present in April were "early" arrivals seeking shelter in the dense Douglas-fir stands until conditions were more conducive to occupying their more open summer habitats.

This year, 3 additional habitat patches were mapped (making a total of 4 sites), and these were the focus of the calling surveys.

#### Recommended Efforts:

As program funding and priorities allow, survey the Mt Helena Ridge more extensively, beginning in April 2005, to locate additional flammulated owls. Conduct surveys at dusk and during the first half of the night. Follow up with more intensive monitoring of sites where owls have been located to identify nesting habitats. Look into the potential for generating a research project to examine these habitat relationships in more detail—as they appear to be somewhat atypical.

Report is available on file at the Helena Ranger District (contact Brent Costain).

## Peregrine Falcons

### Monitoring Activity:

Sites where peregrine falcons have established eyries in recent years were monitored to see if falcons had returned and to get an estimate of young fledged. Previously-occupied sites checked were at lower Meriwether Canyon, mid-Meriwether Canyon, Hanging Valley, and Trout Creek. New areas perused were lower Soup Creek, upper and lower Refrigerator Canyon, upper Meriwether Canyon, Candle Mountain, and Hogback. Most of the survey work was done by biologists from the Townsend Ranger District and the Montana Peregrine Institute.

### Analysis:

A pair of falcons was observed near traditional eyrie sites downriver from Meriwether Canyon on the Missouri River. This eyrie, established in 1989, had been apparently vacant in 2001-2003, and has now been re-established. The eyrie fledged 3 young in 2004. Peregrines have been observed in Trout Creek Canyon since 1993, and eyries have been located each year since 2000. This year the eyrie fledged 3 young. Falcons reported from Hanging Valley are probably associated with this eyrie. A single peregrine was observed fortuitously about 2 miles east of Hedges Mountain in October.

### Recommended Efforts:

As program funding and priorities allow, 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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## Lynx Hair Snare Surveys

### Monitoring Activity:

The Big Belts began a three year survey effort using the National Lynx Detection Protocol to determine presence and absence of lynx. This is the final year of this three year survey.

### Analysis:

Nine transects with a total of 45 plots were left over winter and checked, and twenty-six samples were collected. Twenty-five transects with a total of 125 plots were visited twice to collect hair samples. Genetic analysis of hair collected at survey sites did not identify lynx at any of the locations. Hair analysis identified bobcat, coyote, ungulate, and black bear.

### Recommended Efforts:

No recommendations at this time.

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## Black-backed Woodpecker Surveys/Cave Gulch

### Monitoring Activity:

Black-backed woodpecker surveys in the Cave Gulch wildfire areas - the methodology followed is from Designing Field Studies to Detect Habitat Change for Cavity-Nesting Birds (Dudley and Saab, DRAFT January, 2002).

### Analysis:

The purpose of the surveys is to determine nest occurrence and density of black-backed woodpeckers in the Cave Gulch fire area and to determine effects of salvage harvest in the Cave Gulch fire area on black-backed woodpeckers. The surveys will be conducted every year for four years (2 to 6 years post-fire).

Two sites in the wildfire area were selected. Each study site (control and impact) is approximately 750 acres. One study site is control, one study site will be salvage harvested.

Results from this year's survey; six black-backed woodpeckers were observed and more heard, other species observed include; three-toed woodpeckers, Northern Flicker, Downy Woodpecker, Hairy Woodpecker and Mountain Bluebirds. The results are consistent with other findings that black-backed woodpeckers occur in burned forests.

#### Recommended Efforts:

No recommendations at this time – this was the final year of black-backed woodpecker data collection in the Cave Gulch area.

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## Birds and Burns Network

### Monitoring Activity:

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

In 2004, 33 woodpecker nests were located and monitored. Eight of the 2004 nests were in the same trees as in 2003 so no vegetation sampling will occur at these sites. Vegetation sampling is in progress for the remaining 25 nest locations monitored in 2004.

In 2004, each of the 76 random points were surveyed three times for birds.

41 transects were established to aid in finding woodpecker nests. They were systematically placed 200 m apart on the four study sites. Each transect was surveyed at least once. Most surveys included using a play-back device to increase the probability of encountering a woodpecker. Transects where woodpeckers were detected were repeatedly visited until the nest was found.

### Analysis:

Forty-five different species were detected during bird surveys with a total of 2129 detections. Red-breasted nuthatches were detected most often (361 times), followed by Red-tree Squirrels (317), Mountain Chickadees (186), then Dark-eyed Juncos (175).

33 nests were monitored during the 2004 field season. All nests were occupied by woodpeckers. No bluebird nests were found. Four nests on the ST unit, one on the SC unit, nine on the MC unit and 19 on the MT units were found. Species for which nests were found include the Red-naped Sapsucker, Hairy Woodpecker, Downy Woodpecker, Northern Flicker, and the Northern Three-toed Woodpecker. Although aspen trees comprised a relatively small portion of each unit, all nests were in aspen trees or snags. No woodpeckers nesting in coniferous trees were found, although numerous chickadees and nuthatches were observed nesting in these trees.

Compared to the 2003 season (87 percent nest success), fewer nests successfully fledged at least one young in 2004 (76 percent success). Whereas all nest losses in 2003 were attributed to predation (3 of 23 nests), two nest losses (of 33 nests monitored) were attributed to predation in 2004. By contrast, six total

nest losses were attributed to inclement weather conditions in 2004. In 2003 the weather was much warmer and dryer in the Elkhorn Mountains. Cooler temperatures, frequent rains, and one large snow storm (6 to 8 inches of snow) likely contributed to some of the nest failures that were observed in 2004.

In addition to the weather, the impacts of predation on chicks within nests also seemed greater in 2004. Red-tree squirrel numbers were up significantly in 2004 and a number of nests lost chicks shortly after the cavity entrance had been enlarged by red-tree squirrels. In 2003 the average number of chicks fledged from successful nests ( $n = 20$ ) was estimated to be 3.6. In 2004 this dropped to only 2.7 chicks per successful nest ( $n = 25$ ). These numbers do not include nests that totally failed.

**Recommended Efforts:**

Collect a 3<sup>rd</sup> year of pre-treatment data on birds and nest success.

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**Vehicle Use and Big Game Habitat Effectiveness in the Divide Landscape****Monitoring Activity:**

Surveys of roads and motor trails designed to clarify ground conditions for the Divide Travel Plan were continued this year. In several areas in the Divide landscape, roads and motor trails appear to be influencing habitat effectiveness and security for elk, deer, and other big game species. In some cases, the local character and potential impacts of such routes are poorly understood. Three potentially problematic road/trail systems were surveyed from mid summer through early fall: the Black Mountain trail, the Treasure Mountain – Negro Mountain road network, and the Baldy Ridge road/trail system. Proximate objectives were to determine the condition and character of each route, the nature of human activity, patterns of local wildlife use, and the interaction between human and wildlife components. GPS units, maps, and aerial photos were used to accurately map the routes. Information was recorded via digital photos and detailed field notes.

**Analysis:**

The new information resulted in modification of base maps being developed for the on-going Divide Travel Plan. Segments of the Treasure-Negro Mountain system shown on draft working maps were found to be incorrectly located, non-existent, or inappropriately designated. Fieldwork demonstrated that some routes initially proposed for closure were actually in low-risk wildlife areas, while others proposed as open routes were problematic for elk, as well as a number of other road-averse species. The Black Mountain trail is an extensive new trail pioneered by motorized users and, until now, unknown to the Forest. It was mapped in detail and its impact on an area previously unaffected by motorized use was recorded.

**Recommended Efforts:**

As program funding and priorities allow, continue to monitor, focusing on other routes that might pose problems. These include the upper Ontario-Bison Creek system, the Slate Lake system, the upper Dog Creek system, the American Gulch road, and the western Frohner road/trail system. Continue to monitor the Black Mountain trail and assist law enforcement personnel in dealing with it: the trail impacts an area important to elk, grizzly bears, lynx and other wildland species, and it should be closed.

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**Mining Effects on Wildlife Habitat****Monitoring Activity:**

Two areas that have been mined to various degrees in the past—upper Hope Creek and Uncle Ben Gulch— were surveyed to determine the potential for proposed new mining exploration to impact local wildlife habitat.

**Analysis:**

In both cases, proposed exploration activity is limited enough in scope to pose little problem to local wildlife communities. Habitat loss would be minimal. Conflicts are likely to involve recreationists (esp. hunters) more than wildlife.

**Recommended Efforts:**

As program funding and priorities allow, there should be follow-up monitoring of the affected areas.

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**Effects of Roads and Trails in the North Belts on Big Game Habitat****Monitoring Activity:***Roads and Trails Survey:*

A survey of roads and trails that appeared to be problematic for elk and other big game species was continued. Information was recorded in detailed field notes and via digital photos keyed to maps. Immediate objectives were to detail the status of each route, discern the pattern and intensity of human activity, note the nature of wildlife use, and determine what courses of action would be in the best interests of the wildlife resource. Routes examined were the Favorite Gulch-Devils Tower area road system, the Sweats Gulch-Hogback trail, and the Beartrap road/trail system.

*Bull-Sweats Monitoring:*

Annual walk-through surveys of the Bull-Sweats project area (thinning and underburning in ponderosa pine—initiated in 1998) are designed to monitor post-treatment development of ground vegetation and changes in use patterns of elk and deer, as well as birds and small/mid-sized mammals. Surveys were conducted in April and July. Two transects established by the Regional landbird survey program lie within the project area and are monitored every other year.

*Favorite Gulch Survey:*

The Favorite Gulch region between Beaver Creek and Trout Creek was surveyed extensively in expectation of a proposed fuels treatment project.

**Analysis:***Roads and Trails Survey:*

Based on monitoring information, area travel maps were modified to reflect the actual configuration of roads and trails on the ground. Some proposals for managing the routes to benefit wildlife resulted. The Sweats Gulch trail, blocked by a 6-8 year-old mass of wind-thrown timber, has not been used by ATVs or trail bikes. No connecting route was found between this trail and the motorized Powerline trail as shown on maps. The abandoned Beartrap road continues over to Soup Creek as a trail, but there is no established route connecting to Hogback Ridge as suggested by OHV advocates. This route appears to have been abandoned by motorized users in the last year. Neither the Sweats Gulch nor the Beartrap routes picked up any motorized use during the hunting season. The Favorite Gulch-Devils Tower Region, much of which is designated as a Roadless Area, is laced with long-established primitive roads. Many are not mapped or have been mapped inaccurately. Most use on these routes is during the hunting season, although impacts to elk are minimal since few animals return to the area until early winter.

*Bull-Sweats Monitoring:*

Surveys confirmed patterns described in previous years: increased forage has led elk and deer to make more use of the area throughout the year than prior to treatment. Some elk now remain through the summer. Bird diversity remains higher than prior to thinning. Red squirrels are present but fewer than

before thinning. Goshawks forage in the open stands. Pileated woodpeckers are nesting in the project area.

*Favorite Gulch Survey:*

Primary changes that have influenced patterns of wildlife use in recent years are the expansion of the motorized trail/road network, removal of forest by the North Hills fire in the northern half of the area, and loss of grass-shrub habitat to encroaching conifers in the southern half of the area. The area has no open water most of the year and thus receives little use by elk and deer from April through November. Forest cover is naturally fragmented, and interior forest wildlife communities are meager. There are virtually no red squirrels, for example. Open habitat and edge wildlife is abundant. No threatened, endangered, or sensitive species were noted. Key components include a number of timbered sites in draws, large old trees variously distributed, extensive grass-forb associations that provide winter forage, and aggregations of mountain mahogany.

**Recommended Efforts:**

*Roads and Trails Survey:*

No immediate follow-up work is needed. However, once the North Belts Travel Plan is implemented, as program funding and priorities allow, each of these routes will need to be monitored to determine the effectiveness of vehicle closures and the reaction of wildlife to the changes proposed. The Favorite Gulch-Devils Tower network is likely to prove particularly problematic during the hunting season.

*Bull-Sweats Monitoring:*

As program funding and priorities allow, establish more systematic monitoring routes (aside from established landbird transects); monitor more frequently—including winter.

*Favorite Gulch Survey:*

Some additional monitoring of how big game species use the area is needed—primarily in winter. More thorough analysis of field monitoring results will be needed before detailed recommendations can be made.

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## Monitoring of Fire Influenced Habitats

### Monitoring Activity:

Two areas in dry Douglas-fir and ponderosa pine habitat that have been affected by fires of singularly different magnitude were surveyed for a variety of wildlife components—in particular, forage quality, conifer regeneration, and elk use patterns. The areas examined were (1) the Hunters Gulch-Big Log Gulch, Cochran Gulch, and Devils Tower regions of the North Hills Burn (a stand replacing fire from 1984) and (2) the Bull-Sweats project area, where the mature overstory was thinned (1998-2000) and the understory treated with prescribed fire (1999-2004). Both areas have been monitored regularly in the past. The ultimate objective is to determine what sort of long-term habitat structure and productivity will follow stand replacing fires in forest habitats that historically were subjected primarily to low-intensity underburns—and what the implications for wildlife might be. The Bull-Sweats area, then, provides as a baseline comparison that approximates what historic conditions are likely to have been.

### Analysis:

The North Hills burn is now over 20 years old. The burn covers approx. 27,000 acres—much of it in the Gates-of-the-Mountains Wilderness area. Grass-forb associations are vigorous and diverse in the Big Log-Hunters Gulch region, and provide year-round habitat opportunities for elk and deer. The Cochran and Devils Tower areas are drier: shortgrass-dominated habitats dominate and are used primarily as winter range. Because the Hunters-Big Log region is unroaded, it provides fall security for elk, in spite of the

lack of cover. The Cochran and Devils Tower regions are more accessible to motorized use, forcing elk to confine themselves to more remote sections of those areas in the fall. Foraging opportunities for native herbivores are excellent year-round. Conifer regeneration is extremely limited. Even in areas where mature trees survived the fire, regeneration is restricted to their immediate vicinity. In essence, for much of the area, the fire has generated a type conversion from forest to grassland. Elk and deer use is heavy locally—concentrating on the best foraging opportunities (often at the heads of drainages). Forage is not limiting. Forest cover of any kind appears unlikely to return to most of the area for many decades, if not centuries.

In the Bull-Sweats project area, forage development is most vigorous in areas previously occupied by open-grown forest and in small openings where pre-project needle accumulation was minimal. Grasses and forbs are beginning to invade areas previously occupied by denser forest and thick needle mats—but these sites still support relatively thin ground cover. In spring, elk (cows and yearlings) linger in the project area longer than prior to thinning. A few elk remain in the project area during the summer, feeding at night and bedding down in residual conifer thickets during the heat of the day. As prior to thinning, few animals use the area during the hunting season. Local open road density, not hiding cover, has been the key determinant.

In terms of big game use, the Bull-Sweats area with its residual overstory and the North Hills burn with its scarcity of mature trees are very similar. While retention of the open-grown overstory is important to increased bird and small mammal diversity, it appears to be of relatively little consequence to elk and deer.

#### **Recommended Efforts:**

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

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#### **Effects of vehicle use, recreation, and livestock on ungulate patterns of dispersion**

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

Selected habitat blocks across the Divide landscape were monitored to provide additional baseline information on use patterns of elk, deer, and other big game animals. Emphasis was on the effects of shifting patterns of vehicle use, non-motorized recreation, and livestock, dispersion. Areas surveyed include the Electric Peak roadless area, Mt. Helena Ridge, Treasure Mountain – Negro Mountain, upper Little Prickly Pear drainage, Baldy Ridge – Irish Mine Hill, and upper Ophir Creek.

##### **Analysis:**

For the most part, use patterns conform to those detected in previous surveys (conducted periodically since 1995), but some changes were noted. Several new ATV/trail bike routes have been developed by users in the Black Mountain – Ophir Creek area since 1999, inserting several miles of motor routes into a previously unroaded area and subverting road closures imposed following timber sales in the 1980s. This lowers both summer habitat effectiveness and fall security for deer and elk. In the Treasure Mountain – Negro Mountain area, scant and confusing signing and erratic gate placement have contributed to vehicle use of routes that were intended to be non-motorized. There has been little pioneering of new routes, but use of the network of old and new roads is becoming more extensive. On the other hand, vehicle closures in the Electric Peak roadless area (to OHVs, 1980s; snowmobiles, 1997), Mt. Helena Ridge (to OHVs, 1980s), and Upper Little Prickly Pear (to OHVs, 1999) have become more effective over the years, and opportunities available to elk have increased as a result.

**Recommended Efforts:**

As program funding and priorities allow, continue monitoring other areas where motorized use has been restricted in the last 10-15 years to gauge the effectiveness of the closures and the impacts on big game habitat effectiveness and security. Areas in need of additional monitoring include Slate Lake, the area south of Elliston, Brooklyn Bridge, Little Corral Gulch – upper Lump Gulch, upper Hope Creek, Black Hall Meadows – Colorado Mountain.

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**Summer and winter ungulate monitoring****Monitoring Activity:**

Ground surveys of ungulate winter range were conducted throughout the winter. Surveys focused primarily on elk but also noted concentrations of mule deer and other ungulates at the time.

**Analysis:**

The fall of 2004 was extremely mild with warm temperatures which allowed elk and deer to remain longer on summer ranges with limited early season use of winter ranges. Due to the mild conditions and limited winter precipitation, use of much of the transitional winter range was higher than previous years with less overall use concentrated on traditional winter range. Very limited winter use by elk was observed on the Baldy Mountain winter range although mule deer use seemed to be similar to previous years. Elk used Forest Service lands more extensively throughout the winter period than during previous. The majority of the winter range use occurred later than normal although the timing of spring migration back onto FS lands appeared to be similar to previous years.

Mountain goat monitoring was conducted during the summer months by FWP and FS personnel in the Red Mountain area where ten goats were re-introduced by FWP in 2001. Montana FWP also conducted winter and spring aerial surveys in 2004 for mountain goats in the Red Mountain area. An additional release of mountain goats is anticipated in 2005.

No analysis at this time for Blackfoot. Information has been collected and filed at the Lincoln District.

**Recommended Efforts:**

No recommendations at this time.

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**Effects of vehicle use on ungulates****Monitoring Activity:**

Numerous roads and motorized trails on the district were monitored during the summer and fall field season to evaluate use levels and potential conflicts with ungulates and other big game species to continue gathering information for district travel planning purposes. The primary areas of focus included Odgen Mtn., Dalton Mtn., Copper Creek drainage, Keep Cool and Beaver Creek. Objectives were to determine the condition and character of each route, the level of human use, patterns of local wildlife use, and the interaction between human and wildlife components.

**Analysis:**

The new information will be used to determine travel management options for the Blackfoot Travel Planning process when it resumes. The information gathered is being used to identify needs for yearlong



or seasonal closures to provide elk security, to protect calving areas and winter range, and to provide habitat protection and security for various other species such as grizzly bear.

**Recommended Efforts:**

As program funding and priorities allow, continue monitoring for another season, focusing on routes that provide the greatest risk to wildlife as identified by ID team discussions and through coordination with FWP.

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**Effectiveness of travel restrictions on ungulates****Monitoring Activity:**

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 use. Use of forest habitats proposed for thinning or prescribed burning was noted. Areas surveyed were Odgen Mtn., Dalton Mtn., Stemple Pass area, and Upper Copper Creek drainage.

**Analysis:**

On a broad scale, wildlife use patterns have remained fairly consistent over time. Open road densities have remained constant or even decreased slightly in some areas due to additional closure enforcements for various resource concerns. However, at a finer scale, some changes have occurred in areas due to the Snow Talon fire of 2003, and increasing ATV use. New user-created routes have increased trail densities in some areas reducing habitat security for elk, mule deer, and various other species. Unauthorized ATV 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 ATV use. Although elk use remains heavy in key habitats, whether or not temporal use patterns have shifted to avoid disturbance is unknown.

**Recommended Efforts:**

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

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**Identification of key grizzly bear habitat****Monitoring Activity:**

Habitat surveys in the Continental Divide linkage zone continued to identify areas of key grizzly bear habitat—following up on surveys from 2002 and 2003—and the position of these areas in relation to roads, new building, and other human developments accumulating in the corridor.

Specific sites with suitable habitat components for grizzly bears were identified around Black Mtn, in upper Monarch Creek, upper Hope Creek, along the upper Little Blackfoot, and in the upper Little Prickly Pear – Deadman Creek drainages. The only reported grizzly sighting was in the upper Little Prickly Pear drainage near the Lincoln Ranger District boundary.

**Analysis:**

The increasing density of up-graded roads, OHV trails, and human settlement in formerly remote areas has diminished habitat effectiveness in the Divide linkage zone for grizzly bears. Effective blocks of

unroaded habitat (primarily in the upper Little Blackfoot and upper Little Prickly Pear drainages) are separated by roaded areas, which encompass smaller pockets of good quality habitat.

The report of a large adult grizzly in the upper forks of the Little Prickly Pear drainage follows a pattern of several such sightings over the past few years and suggests that this unroaded area is permanently occupied.

**Recommended Efforts:**

As program funding and priorities allow, continue surveying habitat throughout the Divide corridor with the aim of producing a complete map of key habitat areas for grizzly bears and the human-induced barriers that compromise their use. Survey the Slate Lake – Baldy Ridge area in mid-spring for sign of grizzly activity—and evidence of denning.

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**Potential grizzly bear habitat****Monitoring Activity:**

No surveys specifically targeting grizzly bear habitat were conducted. However, all field surveys took note of potential habitat opportunities for grizzlies—particularly in the core region of the Big Belt Range from upper Willow Creek to Moors Mountain (in the Gates of the Mountains Wilderness) and in the Hogback-Middleman Roadless Area. The wilderness area has been viewed as a part of a potential movement corridor/linkage zone between occupied grizzly habitat in the Northern Continental Divide region and the Yellowstone country to the south. Survey work has been in response to a grizzly sighting in Avalanche Creek further south in the Big Belt Range in 2002.

**Analysis:**

Although much of the northern Big Belt Range is relatively dry, a number of blocks of productive habitat have potential to support grizzlies, at least in the short term (as part of a linkage zone). In particular, the high elevation core region from upper Meriwether Canyon / Willow Creek through Moors Mountain contains drainage-head basins with springs and productive habitat. The mosaic of open parkland, mesic meadows, and dense forest provides good summer habitat. No sign of grizzly bear presence was noted, but black bear sign was abundant. The upper reaches of the North Hills burn provide good foraging opportunities for grizzlies as well.

Other blocks of habitat in the North Belts also support black bears and provide opportunities for grizzlies. Those surveyed in 2004 include upper Sweats Gulch, Beartrap Gulch, and the Spring Gulch-Fields Gulch region. Black bear sign was common throughout all of these areas.

**Recommended Efforts:**

As program funding and priorities allow, conduct more intensive surveys to map specific grizzly bear habitat components—to obtain a more quantitative gauge as to the potential of the North Belts to serve as a viable linkage zone for grizzlies. Surveys should begin with the high elevation core area between Willow Creek and upper Beaver Creek.

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**Grizzly bear foraging habitat****Monitoring Activity:**

Mid to late-summer surveys are conducted 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 sows and cubs utilizing the area. Hair sample collection for the NCDE grizzly bear DNA project was completed in 2004 and DNA analysis results are expected to be released in early 2006.

**Analysis:**

Approximately 15,000 acres of high-elevation, skree slope, army cutworm moth site/grizzly bear foraging areas were surveyed in 2004. Grizzly bear use was present at several of the sites monitored and several grizzly bears were documented 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 documented using this site over the past 25+ years.

**Recommended Efforts:**

As program funding and priorities allow, continue annual monitoring of grizzly bear activities in known army cutworm moth habitats. The effort should be expanded toward the head of the Copper Bowls to the west of Red Mountain to document grizzly bear activity. This area is within the perimeter of the 37,000 acres Snow/Talon fire that burned in 2004.

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**Pileated and hairy woodpecker habitat monitoring****Monitoring Activity:**

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 throughout the Divide landscape.

**Analysis:**

Pileated woodpeckers or their excavations were observed in the Black Hall Meadows area, south of Blackfoot Meadows, and in upper Whiteman Gulch. They require large trees for nesting, and prefer them for feeding, but none of the observations were in old-growth stands. Rather, they were in mature or mixed-aged stands with a component of large old trees—either scattered individually or in clumps (Douglas-fir, ponderosa pine, aspen, cottonwood).

Hairy woodpeckers were ubiquitous in virtually every habitat configuration other than open grassland/shrubland and were identified on virtually every wildlife field survey in the Divide landscape.

**Recommended Efforts:**

As program funding and priorities allow, continue to monitor as a matter of course during all field surveys. 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) should be noted.

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**Pileated and hairy woodpeckers general observations****Monitoring Activity:**

Woodpeckers and suitable woodpecker habitats were noted as a matter of course during all fieldwork.

**Analysis:**

Hairy woodpeckers were observed in virtually all forested habitats—including burns, open park-like stands, and sites with minimal snags.

Pileated woodpeckers were observed in Big Log Gulch, upper Willow Creek, the Bull-Sweats project area, and Vigilante Gulch, and Beartrap Gulch.

**Recommended Efforts:**

As program funding and priorities allow, continue to monitor woodpeckers and suitable pileated woodpecker habitat as a matter of course during all wildlife survey work.

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**Forest-wide Goshawk Surveys****Monitoring Activity:**

Forest-wide Goshawk Surveys were conducted during 2004 in project areas, areas of potential habitat, areas where goshawk nesting activity had occurred in the past, and areas of recent sightings. Surveys were conducted by District Biologists, seasonal technicians, and contract personnel.

Modeled goshawk habitat (model, documentation, and maps are on file at the Supervisor's Office) provided baseline information from which survey areas and transects were established. A Forest-wide protocol was developed based on existing literature and goshawk research (also on file at the Supervisor's Office) utilizing broadcast calls. Walk-through surveys and systematic perusal of potential nesting habitat without the use of broadcast calls were also conducted.

**Analysis:**

Approximately 29 areas were surveyed across the Forest during FY2004. Goshawk territories (PFAs) found to be occupied in the North Belts were identified in upper Willow Creek, upper Big Log Gulch, Vigilante Gulch, Kelly Gulch, and Trail Gulch. All were in mosaics of older mature forest with variable old-growth elements. The upper Willow Creek stands were predominantly Douglas-fir old-growth. Old nest stands found not to be active this year were Jimtown, Bull Run, Cottonwood Gulch, and Hanging Valley. Observed goshawks whose status was uncertain include those reported at Indian Flats and lower Big Log Gulch.

More extensive sampling in the Divide landscape verified the location of nesting territories in Little Corral Gulch, Sweeney Creek, Brooklyn Bridge, and Spring Gulch. It verified goshawk presence at Blackfoot meadows, in Minnehaha Creek, in the area just north of Treasure Mountain, and in main Corral Gulch. All goshawks were associated with mature forest habitats (of varying density) but none were observed in old-growth. Goshawks were not located in previously occupied habitat in upper Lump Gulch, South Fork Quartz Creek, Monarch Creek, and Connors Gulch.

In the Elkhorns, goshawks were detected in Prickly Pear and Indian Creek.

**Recommended Efforts:**

As program funding and priorities allow, continue systematic survey of previously-occupied ranges (Brooklyn Bridge, Lump Gulch, Little Corral Gulch, South Fork Quartz, Minnehaha, Spring Gulch) and continue to investigate potential home ranges as indicated by 2002 mapping and by 2003-2004 sightings. Employ intensive sampling where goshawks have previously been located and more extensive sampling in areas where they have not been found so far.

As program funding and priorities allow, continue monitoring all of the locations surveyed in 2004 through a combination of protocol surveys and systematic searches without broadcast calls—as deemed appropriate. In addition survey gaps between identified home ranges.

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## Site-specific goshawk, pileated, and hairy woodpecker surveys

### Monitoring Activity:

#### *Goshawks:*

Goshawks were monitored through a combination of walk-through surveys and calling surveys (with broadcast recorded calls). Surveys focused on areas where centers of activity had been identified in previous years and where recent sightings had occurred. Indian Meadows area and other portions of the Copper Creek drainage were surveyed.

#### *Pileated and Hairy Woodpeckers :*

Woodpecker sightings were noted during all field operations. Concentrations of dead and dying trees, characteristic pileated woodpecker excavations, and other habitat components associated with woodpeckers were also identified throughout the Blackfoot landscape.

### Analysis:

#### *Goshawks:*

Because goshawks move to new nest sites each year, it is difficult to follow shifts in nesting territories (PFAs) from one year to the next without intensive sampling. Adult goshawks were observed in the Beaver Creek and Indian Meadows area while conducting surveys, but no new nest sites were confirmed in the Blackfoot landscape through monitoring efforts in 2004.

#### *Pileated and Hairy Woodpeckers:*

Pileated woodpeckers and their excavations were observed in various parts of the district while conducting field work. Observations were made in Beaver Creek, Copper Creek drainage and in the town of Lincoln.

Hairy woodpeckers were observed in various forest habitats across the district.

### Recommended Efforts:

#### *Goshawks:*

As program funding and priorities allow, continue surveys of previously-occupied goshawk territories and conduct surveys in areas where new sightings are reported.

#### *Pileated and Hairy Woodpeckers:*

As program funding and priorities allow, continue to monitor for woodpecker presence and activities during all field surveys. Note the presence of pileated woodpeckers in particular, and the habitat structure in which they occur.

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## Marten habitat monitoring

### Monitoring Activity:

Suitable marten habitat was noted wherever encountered during the course of general wildlife surveys.

### Analysis:

Suitable habitat for marten was noted in upper Ophir Creek, in the Treasure Mtn area, in an extensive area around Blackfoot Meadows, between Blackfoot Meadows and Monarch Creek, in upper Hope Creek and Uncle Ben Gulch, and around Black Mtn. Suitable habitat (particularly with large woody debris) is

widely available throughout the Divide landscape, but usually separated from other such patches by less optimal habitat (forested but without abundant large snags and logs).

Marten habitat is more fragmented in the north Big Belts than in other HNF landscapes because of the inherent abundance of dry Douglas-fir, ponderosa pine, and grassland/shrubland habitats and the presence of large burns with scant new forest regeneration. Most suitable habitat noted in surveys was in the bottoms of gulches and creeks, on higher elevation north and east slopes, and in the upper ends of drainages. Good blocks of habitat were noted in upper Willow Creek, Hanging Valley, Vigilante Gulch, Sweats Gulch, upper Big Log Gulch, and parts of Beartrap Gulch.

#### Recommended Efforts:

As program funding and priorities allow, 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).

As program funding and priorities allow, continue to monitor as in the past. Initiate systematic mapping of suitable habitat from field records (1992 to present).

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#### Winter track surveys

##### Monitoring Activity:

Winter track surveys for marten were conducted in conjunction with lynx track surveys in the Copper Creek drainage, Beaver Creek Rd, Dalton Mountain area and Stemple Pass area. Survey days for 2004 were less than in previous years due to poor snow conditions and limited snowfall.

##### Analysis:

Approximately 30 miles of road and trail systems were surveyed during the winter of 2004. Marten tracks were identified in along the Beaver Creek road. Poor snow conditions limited the number of survey days in 2004 and fewer tracks were recorded than in previous years when snow conditions were more favorable to tracking efforts.

#### Recommended Efforts:

As program funding and priorities allow, continue conducting winter tracking.

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## **(C10-C11) Wildlife and Fish**

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

#### Forest Plan Requirements:

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

#### *Intent:*

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

#### Data Sources:

No data collected in 2004.

**Current Efforts and Findings:**

Monitoring of this element ceased in 1992 as no harvest of trees that could become woody debris was occurring. With implementation of the Inland Native Fish Strategy (INFISH) after being amended to the Helena Forest Plan in 1995 (Amendment #14) and implementation of the State Streamside management (SMZ) law, there has been no action to remove streamside trees that could become instream pool habitat.

*Monitoring Activity:*

This monitoring element has not been completed since 1992 because the Forest was not doing any harvest in riparian areas that would affect instream pool habitat for fish.

*Monitoring Methodology:*

The number of pools in a 1000 foot reach of Davis Gulch was counted in 1986 and again in 1992. A visual count was accomplished by walking the stream reach.

*Analysis:*

Over a long period of time, this is a good method to document loss of pools due to decay or washout as well as recruitment of lack of recruitment of new wood that could form instream pools. As long as the Forest is not undertaking management practices within riparian areas that could affect woody debris recruitment to streams, there is no need to monitor for the effect of tree harvest in riparian areas.

**Variability Discussion:**

Not applicable since no sampling was accomplished.

*Variability Measure:*

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

*Monitoring Results:*

There is no monitoring result for 2004. No timber harvest of streamside trees, that could become woody debris, has occurred since 1992.

Monitoring conducted between 1986 and 1992 on one 1000 foot reach of Davis Gulch, where complete removal of trees to the waters edge occurred, showed no reduction in the number of pools.

*Assessment:*

The findings were within the variability measurement for the years the monitoring was conducted. The findings were expected as the existing pools formed by debris did not deteriorate during the time period monitored.

*Actions in response to variability assessment:*

No action needs to be taken.

**Recommended Efforts:**

No need to monitor this element as long as there is a lack of planned activities that could affect streamside trees that could become instream woody debris.

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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:*

The intent is to determine if the quality of spawning habitat is being decreased.

**Data Sources:**

A total of 48 sediment samples were collected from salmonid spawning gravels on 7 stream reaches in 2004.

**Current Efforts and Findings:***Monitoring Activity:*

A total of 48 substrate core samples were collected from six streams throughout the Forest in 2004. Streams sampled included Magpie Creek, Copper Creek, Snowbank Creek, Poorman Creek, Arrastra Creek, the Blackfoot River below Lincoln, and the Blackfoot River above Lincoln near Landers Fork.

*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 followed up with drying the samples, sieving the samples, and then weighing the samples by size class. The results are then used to calculate a Fredle Index and information is portrayed both as a function of percentage of fine sediment less than 6.4 mm and by the Fredle Index.

*Analysis:*

This 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.

**Variability Discussion:**

Because of high natural variability in sediment levels of spawning gravels, statistical differences between samples on different reaches of the same stream or samples taken from different streams are unlikely to be significant using a 90% confidence interval to compare samples. On the same reach of any given stream it may be possible to detect changes, but variability is high enough on some streams such that many more samples likely need to be taken from the same reach on an individual stream over a period of years to be able to detect changes.

Over the long-term, sediment findings from sampling efforts between 1986-2004 have shown that there is wide variation in sediment levels between different streams throughout the Forest. Variability can be high even on different reaches of the same stream while for other streams variability associated with different sites on the same stream is much less. In a similar fashion variability in fine sediment levels can be high for samples collected from the same reach of a single stream.

However, when all the sediment information is pooled together for various reaches from streams of differing geologies, the mean values of sediment present in the spawning gravel has not been found to be statistically different at the 90% confidence level for any of the individual geologies as compared to the



overall average of them all data pooled together. Importantly, however, sediment sampling has shown a tendency for sediment levels to be somewhat elevated in drainages where more human related disturbance has occurred as compared to reference streams where disturbance is limited to natural events. Even in these drainages where human disturbance is high, statistical differences have not been demonstrated - primarily due to the large confidence intervals associated with the mean values.

*Variability Measure:*

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

*Monitoring Results:*

Fine sediment Levels and Fredle Indices for spawning gravels from streams sampled on the Helena Forest in 2004.

Stream Name	Average Percentage of fine sediment less than 6.4 mm	Average Fredle Index Value
Poorman Creek	32.2	3.8
Arrastra Creek	30.7	3.5
Snowbank Creek	42.0	3.0
Copper Creek	30.7	4.6
Magpie Creek	42.7	Not calculated
Blackfoot River below Lincoln near Dalton Bridge	27.1	5.1
Blackfoot River above Lincoln near the confluence of Landers Fork	29.1	4.4

Sediment levels in Snowbank Creek were substantially elevated over what was present prior to the post-fire flood event that occurred in 2004, but that was expected to occur if a substantial thunderstorm were to occur in the burned over drainages. Magpie Creek sediment levels are still similar to what was found in 2003, but are not statistically different from the levels that were present prior to the flood event following the Cave Gulch Fire.

Sediment levels in Poorman Creek, Arrastra Creek, and the Blackfoot River are similar to findings from past years.

*Assessment:*

Sampling conducted over the last 18 years on streams such as Poorman Creek and Copper Creek has demonstrated that the quality of spawning gravels has not declined during that time period based on statistical significance levels of 90%. Consequently we have met the intent of this monitoring element on streams where we have collected enough samples to make comparisons.

*Actions in response to variability assessment:*

Although statistical changes in sediment levels cannot be demonstrated within spawning gravels at the 90% confidence level from the results shown here, earlier monitoring reports documented that sediment levels in some streams were elevated in managed drainages as compared to unmanaged drainages. These earlier reports included discussion suggesting that the increased disturbance associated with management activities had a role in the managed drainages having higher sediment levels. The recommendation from these earlier monitoring reports was that a Forest Plan amendment be developed that included standards for sediment levels in spawning gravels. The Forest did not develop a Forest Plan amendment to address

the sediment issue, but since 1992 has been implementing an approach for vegetative treatments that any ground disturbing management actions proposed in various drainages will focus on reducing sediment production from existing levels or at least have no net increase in sediment delivery from existing levels. This approach is aimed at meeting or exceeding Forest Plan Standard for General Watershed Guidance #4 (Helena Forest Plan pg II-25.)

#### Recommended Efforts:

Monitoring of sediment levels in salmonid spawning substrates is a useful element to continue, but it is very difficult to show statistical significance in many streams as a function of management activities due to high natural variation of sediment levels in stream gravel substrates. Sediment sampling of spawning gravels is valid for showing trends and for defining existing conditions in watersheds in relation to the level of management activities and/or natural events that have occurred. The trend data from information collected throughout the Forest since 1986 suggests that fisheries concerns with higher sediment levels in drainages having high road densities is supportable and that efforts to decrease or at least assure no elevations from current sediment levels are worthwhile. Long-term trend data is also very useful especially in important fishery streams to establish bounds on the level of natural variability for sediment levels in spawning substrates.

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### (C12) Streamside Cover for Fish

#### Forest Plan Requirements:

To assure management activities do not degrade the habitat of riparian dependent species, monitoring is conducted to assess streamside cover for fish, forage utilization, streambank trampling, and 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:

Implementation Monitoring Findings, Findings from monitoring associated with requirements of the Biological Opinion on several Helena Forest Livestock Allotments. Spot checks using pace transects to assess bank disturbance levels in other locations other than specific sample transect locations.

#### Current Efforts and Findings:

Use of the Cowfish Model 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 required by the U.S Fish and Wildlife Service biological opinion for bull trout completed on Forest Plans in Washington, Oregon, Idaho and Montana. Additionally, monitoring of bank disturbance levels is completed at a number of locations throughout several grazing allotments west of the continental divide in the Little Blackfoot River drainage as part of the Terms and Conditions of a site specific Biological Opinion completed for livestock grazing on the Helena Forest by the U. S. Fish and Wildlife Service to address adverse impacts of livestock grazing to bull trout.

Implementation monitoring efforts have shown that the Forest has met stubble height requirements on allotments west of the continental divide with one exception. The bank disturbance monitoring has also indicated that conditions are being met throughout the sites monitored west of the continental divide with one exception. Other monitoring of riparian habitats east of the continental divide was conducted as described in Monitoring Element D1.2

*Monitoring Activity:*

Grass stubble heights are measured along the greenline of riparian areas as part of the Implementation Monitoring discussed below. Currently, on most of the transects, a 6 inch stubble height for sedges is used. Bank disturbance is measured on several transects for the Blossburg, Spring Gulch, Hat Creek, and Ophir/Hope Allotments. Additionally, range personnel monitor browse utilization, stubble heights, and disturbance in a number of other riparian areas as discussed in element D1.2 below.

*Monitoring Methodology:*

The Cowfish Methodology was utilized from 1986 - 1992 on a selected number of stream reaches that were considered to be susceptible to being negatively affected by livestock grazing. Monitoring to meet the Terms and Conditions of the U.S Fish and Wildlife Service 1998 Biological Opinion is being conducted by the Implementation and Monitoring Team on a Regional Basis. These teams have an established protocol for monitoring. For grazing, use of residual stubble height of vegetation on the greenline is the minimum monitoring element. For the Helena Forest stubble the minimum stubble height on the greenline is 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%.

*Analysis:*

Monitoring methods are aimed at determining if effects to fish habitat have occurred due to livestock grazing. Measurements of stubble height can be used as a less costly measure to ensure bank disturbance is maintained to standard than measuring bank disturbance directly. However, until relationships are better established, it is currently assumed that measuring bank disturbance directly is a more sure means of assessing effects to fisheries.

**Variability Discussion:**

*Variability Measure:*

Decline in the Cowfish 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 utilized as a monitoring tool, this variability measure is no longer pertinent. Instead, use of the 6 inch stubble height along the greenline and bank disturbance of no more than 20% are two measures used on allotments east of the divide.

*Monitoring Results:*

Monitoring conducted between 1987 and 1993 using the Cowfish Model indicated that livestock grazing was having negative effects on fish habitat. Monitoring conducted west of the continental divide since 1999, using methods outlined in the monitoring methodology section above, has indicated that negative effects to fish habitat continue to occur with bank disturbance levels exceeding 20% a number of times for a number of transects on one to two allotments.

*Assessment:*

Since Cowfish is no longer used, the variability measure does not apply to 2004. However, several riparian areas across the Forest did not meet the Cowfish HSI requirement of 0.6. based on findings from

1987 to 1993. Riparian monitoring conducted during 2004 indicated that there are continued negative effects to riparian habitats in some locations on the Blossburg Allotment. There are indications that use of a six inch stubble height along the streamside vegetation is not adequate to keep bank disturbance levels below 20% on sensitive streambanks.

*Actions in response to variability assessment:*

Recommendations to develop a Forest Plan amendment to address effects of livestock were included in earlier fishery monitoring reports. In response, the Helena Forest developed riparian guidelines in addition to the ones in the Forest Plan. These guidelines were brought forward as part of a Forest Plan amendment for the Elkhorn Mountains. However, the amendment was overruled in court. The Forest continues use of the new riparian guidelines forest-wide under Helena Forest handbook (USDA Forest Service 1998) direction.

In addition to the establishment of riparian guidelines, a number of riparian areas were fenced over the last 15 years to exclude livestock use from riparian areas with the intent to reduce impacts to fisheries by improving cover and reducing bank disturbance from livestock trampling. Fence enclosures were constructed on portions of Elliston Creek, Snowshoe Creek, Pikes Gulch, Trout Creek, Meadow Creek, Uncle George Creek, Dog Creek, Jenkins Gulch, Indian Creek, and Eagle Creek. Enclosures on Jenkins Gulch, and Pikes Gulch are no longer in place. In addition to riparian enclosures, additional water developments to draw livestock away from riparian areas were developed on the Blossburg Allotment (two developments) Slate Lake (1 development) Alice Creek Allotment (1), Willow Cr Allotment (1), and the West Nevada Allotment (1).

**Recommended Efforts:**

Rather than using Cowfish, the Forest should continue the Implementation and Effectiveness monitoring being conducted as part of meeting the Terms and Conditions of the 1998 Biological Opinion on the Forest Plans for forests in Washington, Oregon, Idaho, and Montana. Bull Trout Level 1 monitoring requirements on livestock allotments having formal consultation, riparian condition surveys using the Proper Functioning Condition Concept, and continued range monitoring evaluations of browse utilization, herbaceous stubble height, and (Monitoring element D1) of riparian habitats should also continue. From a fisheries perspective, continuation of monitoring to determine bank disturbance levels associated with the adverse allotment monitoring is a very important element to continue.

Because the extensive monitoring effort in the Blossburg allotment between 1999 and 2003 has shown the difficulty of meeting the streambank disturbance guideline in the site specific biological opinion, it is recommended that some additional means of controlling livestock be implemented for additional reaches of Dog Creek (Blossburg Allotment) and a ½ mile reach of Spring Gulch (Spring Gulch Allotment). 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. As additional livestock allotment management plan updates occur throughout the Forest, the magnitude of fish habitat present in the allotment, the susceptibility of that habitat to being impacted by livestock grazing, and the condition of that habitat should be addressed. If fish habitat conditions warrant, required mitigation should be included in those allotment management plan reauthorizations that will reduce stream bank disturbance to what is specified in Helena National Forest Riparian guidelines (USDA 1998).

Additionally, spot monitoring of bank disturbance should be implemented on some allotments east of the continental divide where updated allotment management plans have been completed. This would determine if mitigation measures for fisheries have been effective.

Spot monitoring should also be conducted on existing older allotment management plans where westslope cutthroat trout are present east of the continental divide. This would determine if those populations are being impacted excessively by livestock grazing.

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

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

Aquatic invertebrate populations are to be monitored on 30 stream segments with 6 samples per stream segment.

#### *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:**

No samples collected in 2004.

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

No samples collected in 2004.

#### *Monitoring Activity:*

No conducted for this element in 2004.

#### *Monitoring Methodology:*

Collect aquatic macro-invertebrates and assess the Biotic Condition Index.

#### *Analysis:*

This is a good method to document effects to fisheries if chemical pollution or nutrient enrichment of waters is expected. The methodology is not well-suited for detecting effects when only minor changes in sediment delivery are expected.

#### **Variability Discussion:**

The variability factor that would stimulate action, as currently cited in the Forest Plan C13 Monitoring Element, would best be restated to address site-specific conditions rather than inferring changes on a Forest-wide basis. With the high variability that tends to occur in aquatic invertebrate sampling and high cost of collecting and analyzing samples, it is likely better to measure sediment levels directly where sediment is the concern being addressed. As discussed below, use of aquatic invertebrates and use of the biotic condition index remains a good monitoring tool for situations where chemical pollution or nutrient enrichment has occurred or is likely to occur.

#### *Variability Measure:*

Currently stated as Annual decrease from present in Biotic Condition Index (90% confidence).

#### *Monitoring Results:*

No results as no sampling was conducted in 2004.

#### *Assessment:*

Not applicable as no sampling has been conducted in 2004.

*Actions in response to variability assessment:*

Not applicable as no sampling has been conducted in 2004.

**Recommended Efforts:**

Do not utilize this element to monitor for effects from forest projects where the most likely effect is projected to be minor increases in sediment delivery to streams. Utilize this monitoring element for projects when there is potential for substantial changes in water quality are expected such as from mine effluent, chemical pollution of some kind, or nutrient enrichment.

Data is expensive to collect and analyze, and will not show changes on projects where minor changes in sediment delivery occur due to the variation in both the invertebrate populations and the variations in sediment levels that occur naturally in both managed and unmanaged watersheds.

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

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**(D1.1) Utilization of forage in transitory range****Forest Plan Requirements:**

Range inspections, forage utilization exams, regeneration surveys, and 22 transects are to be monitored in order to determine correlation between level of forage utilization in transitory range and mechanical damage to seedlings.

**Current Efforts and Findings:**

Utilization surveys and regeneration exams over the years have identified instances of trampling damage to regeneration within a few harvest units, but never at levels which resulted in stocking reductions to unacceptable levels or that would merit more aggressive control measures for livestock grazing.

1999, 2001, and 2003 plantations within grazing allotments were inspected by both range and cultural personnel. While incidental cattle use was noted in some plantations, cattle readily use the pine grass and elk sedge typically found in plantations. No seedling damage from cattle trampling or foraging was observed in 2004.

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**(D1.2) Percent of available forage utilized by livestock**

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**Forest Plan Requirements:**

Range inspections, forage utilization exams, regenerations surveys, and transects should be monitored to determine actual livestock use and if utilization constraints of FP are being met.

**Current Efforts and Findings:**

Methodology has changed from the Forest Plan and is documented in a Forest supplement in the Range Handbook. Current riparian standards in AMPs for forage and browse utilization, stubble height, and disturbance are measured in riparian areas. Upland sites are measured by stubble height or forage utilization, depending on the site. All site visits and measurements are documented by the Forest Service and permittees, and are filed in annual diaries and input into INFRA by pasture and key area.

Forest Service personnel and permittees continue to monitor forage conditions closely due to continuing drought conditions. Forage utilization monitoring was completed for 35% of the allotments including all bull trout allotments (26) and other allotments, both active and inactive (12 out of 100). This level of monitoring includes field utilization reports and photo records provided by the permittee. The range

program also continues to focus on the implementation of recent allotment management plans and resolving non-compliance problems.

**Recommended Efforts:**

Utilization and other annual monitoring standards and guidelines should continue to be incorporated with FSH Forest Supplements.

**(D2) Allotment Management planning and update**

**Forest Plan Requirements:**

FSRAMIS (range inspection reports) are to be monitored to insure: updates at 15-year intervals, adherence to the plan, management objectives are being met, and improvements are maintained.

**Current Efforts and Findings:**

No AMP's were updated in 2004. A schedule has been developed for completing the AMP's referenced in the Recissions Bill.

**Recommended Efforts:**

The INFRA data system has replaced FSRAMIS as a data source for Allotment Management Planning. The Forest has developed a schedule to comply with the 1995 Rescission Bill as it pertains to allotment management plan revision, but has fallen behind that schedule.

**(D3) Weed infestations**

**Forest Plan Requirements:**

Allotment inspection records, reforestation exams, range analysis, mining projects, and road inspections are to be completed to monitor the effectiveness of weed control measures, and responsible implementation of IPM techniques.

Implement an integrated weed control program in cooperation with the State of Montana and County Weed Boards to confine present infestations and prevent establishing new areas of noxious weeds.

*Intent:*

Monitor weed infestations, evaluate effectiveness of control measure activities, and coordinate with neighboring agencies, while implementing Integrated Pest Management techniques consistent with the Montana State Weed Management Plan.

**Current Efforts and Findings:**

<b>Total FY04 Helena NF Direct Weed Control (acres)</b>				
<b>Control Type</b>	<b>D1</b>	<b>D2</b>	<b>D4</b>	<b>Total</b>
Herbicides (Acres)	301.75	1108	2811.6	4221.35
Biological Agents (insects)	5	3	1	9.6
Pulling (Acres)	1	7	1	9
Revegetation (seeding)				
Cultural (mowing / irrigation)		4		4
<b>TOTAL</b>	<b>1552.75</b>	<b>1864</b>	<b>3062.6</b>	<b>6634.35</b>

*Herbicide Treatments*

<b>FY04 Herbicide Treatment by Fund Code (acres)</b>				
<b>Fund Code</b>	<b>D1</b>	<b>D2</b>	<b>D4</b>	<b>Total</b>
CWKV - KV	35	22	93	130
NFVW – Weed Mgt.	54.5	946	414.10	1414.6
WFHF - Fuels		5		5
NFWF - Wildlife		8		8
BAER – Burned Area Recovery	61.75		297	358.75
COOP		116	1997.5	2113.5
NFN3 – Fire Rehab				
FIRE SUPPRESSION REHAB				
CONTRACT	136			136
RAC – Resource Advisory Committee			20	20
STEWARDSHIP				
Administrative Site	6	8		14
<b>TOTAL</b>	<b>293.25</b>	<b>1108</b>	<b>2524.6</b>	<b>3925.85</b>

<b>FY04 Herbicides Used</b>					
<b>Herbicide</b>	<b>Registration#</b>	<b>Lbs/Ai</b>	<b>Acres</b>	<b>Ranger District</b>	<b>Application Method</b>
2,4-D	228-145	2051.75	2051.75	HNF	Ground
	01381-00103				
	71368-1				
	34704-120				
	5905-501				
PICLORAM	62719-6	507.8	2031.25	HNF	Ground
IMAZAPIC	241-365				
CLOPYRALID	62719-259	16.5	58.25	HNF	Ground
METSULFURON METHYL	352-439	120	79.5	HNF	Ground
CLOPYRALID/2,4-D (CURTAIL)	62719-48				
CHLORSULFURON	352-522	80.25	53.5	HNF	Ground
DIGLYCOLAMINE	100-884				
GLYPHOSATE	42750-61				
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 2400 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 completed a total of 9.6 releases @ 5 acres / release for a total of 2400 acres treated with biological management agents.

FY04 Biological Management Agent Release				
Ranger District	Biological Agent	Total # Released	# Of Releases @ 250 Released	Target Species
Townsend & Lincoln	Cyphocleonus achates	1,150	4.6	SK
Helena	Cyphocleonus achates	750	3	LS
	Apthona lacertosa			LS
	Obera erythrocephala			LS
Townsend & Helena	Mecinus janthinus	500	2	DT
	Brachypterolus pulicarius			DT
	Aplocera plagiapa			SJ
	Chrysolina spp			SJ
	Ceutorhynchus.litura			CT
	Urophora.cardui			CT
	Cyphocleonus achates			SK
	Mecinus janthinus			DT
	Chrysolina spp.			SJ

Manual Treatment

Pulling occurred on approximately 4 acres of weed infested areas on the Helena NF. This activity was focused on small infestations in backcountry areas, trailheads, ranger stations, campgrounds, grazing allotments, administrative sites, and burned areas. Table 5 below provides details on this activity.

FY04 Weed Pulling		
Ranger District	Acres Pulled	Location/Target Weed
Townsend	1	Knapweed pulled in Whites gulch between the salt ground and ridge in the South pasture
Townsend	Few plants	
Helena	2	Knapweed, Perennial pepper weed, Dalmatian toadflax were pulled at various times on administrative sites to eliminate non-target mortality.
Helena	5	Knapweed, and Dalmatian toadflax were pulled at various times in the Gates of Mountains Wilderness area, specifically at Meriweather and Coulter campgrounds to eliminate non-target mortality and recreation/public visitor herbicide concerns.

FY04 Weed Pulling		
Ranger District	Acres Pulled	Location/Target Weed
Lincoln	1	Knapweed, yellow toadflax, common tansy, and St. John'swort were pulled at various times on administrative sites, and riparian areas to eliminate non-target mortality and recreation/public visitor herbicide concerns. Aspen Campground and Moose Creek Trailhead.
TOTAL	9	

#### Cultural Control

Mowing and watering was conducted at many of the developed recreation sites, livestock facilities, trailheads, and other administrative worksites. Cultural weed control activities are summarized below.

FY04 Cultural Weed Control		
Ranger District	Acres Treated	Site And Treatment
Townsend	Few Plants	Musk thistle cut on the top of the divide between Avalanche and Whites gulch.
Helena	4	Musk thistle infestations were chopped around an electric fence enclosure in a Riparian area to reduce the potential of shorting out the electrical current and to prevent seed production.
TOTAL	4	

#### Weed Education

Weed education, awareness, and prevention are a high priority on the forest. Basic weed awareness and identification training is provided to the districts at orientation and field identification handbooks and weed calendars are made available to employees. Weed education is an ongoing activity on the Helena NF and is not limited to formal presentations. Constant interaction occurs between the Helena NF weed staff and all functional areas and specialists. Districts are signing trailheads with weed awareness information, "Weed Free Feed Required" signs are posted on major forest access roads, recreation site bulletin boards, "Leave No Weeds" posters, and other weed information brochures.

FY04 Educational Presentations				
Date	Teacher	School	# of Presentations	# of Students
January 04	Meagher Co./FS	Conservation Group/NRCS	1	14
January 04	Sharlene Sing/FS	MWCA Annual Meeting	1	300
March 04	Wes Simpson	Dow Agro Sciences/FS	2	50
May 04	Liz Wishman	Townsend Grade School	1	25
May 04	Jay Winfield	Dearborn WMA	2	40
May 04	Shawn Heinert	Patterson Prairie WMA	1	5
July 04	Jay Winfield	Elkhorn Working Group	1	11

FY04 Educational Presentations				
Date	Teacher	School	# of Presentations	# of Students
July 04	Wes Simpson, Phil Walsh, Vicky Maclean, Jim Nelson	Lewis and Clark Co. Fair Booth	8	120

A more detailed report of accomplishments can be found in the 2004 annual report.

*Monitoring Activity:*

*Monitoring / Mapping*

Depending on funding, herbicide and biological monitoring is conducted each year. Monitoring typically consists of photopoints, stem counts, net sweeping, and/or ocular observation and detailed vegetation analysis. It provides an overview of treatment effectiveness and provides information for adaptive management. Nine biological release sites and 59 plus herbicide treatment sites were monitored in FY 04. Due to the long term nature of biological control, it may not be cost effective to do extensive monitoring every year.

In FY 04 the Helena contracted to have detailed biological agent monitoring done on the sites listed in the table below. 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 landownerships. The project report identified sites with sufficient insect populations for future collections and sites suitable for future releases.

FY04 Biological Monitoring					
Site	Bio Agent	Target Species	Photo Points	Stem Counts	Net Sweep
Cave gulch	Mecinus janthinus	DT	8	8	
Horse Gulch	Apthona nigricutus/flava	LS	1		3
	Larinus minutus	SK			
	Apthona nigricutus/lacertosa	LS			

FY04 Biological Monitoring					
Site	Bio Agent	Target Species	Photo Points	Stem Counts	Net Sweep
Wilson Creek Insectary	Cyphocleonus/Agapeta/Larinus	SK	2		
Deep Creek Section 19	Cyphocleonus/Agapeta/Larinus	SK		Dug 6 plants. All roots contained weevil larva	
	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			

FY04 Herbicide Monitoring		
Site	Target Species	Method/Observations
Townsend		
Belts: off road		
5/26/04	knapweed	Whites Drainage, #16 Gulch ridge to Bilk Mt. and down to Springs Gulch. Ocular observations of treatments done in 2001 and 2002. Retreat 100 acres within the area
6/30/04	Knapweed/Canada thistle/musk thistle/ toadflax/spurge	Checked old clearcuts to assess treatments done in 2002 and 2003. Few scattered weeds remain. Went up the new Hunters Gulch trail, found 350 acres of toadflax. (contract treated in Sept. 04)
7/01/04	Knapweed/ toadflax/ thistles	Went up Jimmys Gulch (Confederate) into the Whites south pasture checked all closed roads, atv trails, and areas where weeds had been in the past plus areas that were clean in the past. Found about 25 acres of scattered toadflax that has never been treated.
7/20/04	Knapweed/toadflax	Went up Doolittle to Beartrap Spring. Musk thistle gone.. toadflax remains on steep side hills above the areas backpack sprayed in 2003. 50 acres scattered toadflax need treatment. Knapweed reduced by 90%.

FY04 Herbicide Monitoring		
Site	Target Species	Method/Observations
		Upper Doolittle clean, but cheatgrass is invading. Next checked Timber Gulch where horsepack sprayers had sprayed small toadflax patch. All veg. in patch stressed, only toadflax is coming back. Re-veg in 05 (about 2 acres). Continued to top of divide where I pulled a few musk thistle rosettes.
7/14/04	Knapweed/thistles	Whites, NE pasture, and Spring Gulch divide fence. Found large patch (350 acres) of knapweed near the large pond. Contract treated it in Sept. 2004
10/14/2004  11/09/04	Knapweed/toadflax	Hellgate Gulch: surveyed from the forest bndry to the top of Harris Gulch then west to the pvt. Seabrook land. The spray efforts from 2002 and 2003 looked good. Still 95% clean. Next, looked at the ridge towards Magpie. Needs 1 to 2 people to backpack or ATV spray for 1 day in 05. Checked upper Hellgate from the Argo Mine to the Thompson tanks in the Avalanche Allotment.
7/8/04	Canada Thistle/knapweed/houndstongue	Canada thistle had increased along both sides of the road. Plan helicopter spray for 05 (if weed EIS is implemented) or ground spray approx. 1000 acres.
Elkhorns: off road		
6/3/04	Knapweed, houndstongue, toadflax, thistles	Sec. 35, and 26 checked an area that had been sprayed in the past found a few knapweed and toadflax. The fence is down in many areas. Treat weeds in 05 if possible.
7/13/04	toadflax	Jerry Grebenc sent me a map with toadflax locations marked in the Beaver Cr. Drainage. Treat these in the contract RMEF grant proposal, 05.
10/20/04	toadflax	Checked the Hog Hollow burn unit for weeds and planted 11 toadflax plants with m. janthnus larva to see if the larva would survive a prescribed burn passing over. Check in spring 05 and spray plants.
11/16/04	Knapweed, toadflax, houndstongue	Surveyed fence #109 and noted (mapped small amt. of kw. Dt. And Ht.
Deep Creek: off road		
7/03&04/2004	Knapweed/houndstongue, thistles, tansy	Checked the East, middle and West fork of Cabin Gulch. The weeds that were sprayed in late May and early June had died, but many new weeds had germinated and grown in the intervening weeks.
6/22/04	Houndstongue, knapweed, thistles, hawkweed, tansy	Checked the proposed treatment area (prescribed burning) in section 19 through sec. 24. Also checked the insectary for kw bugs in sec. 19. There was less than 1 acre of weeds, mostly houndstongue in the project area.
8/17/04	Knapweed/houndstongue, thistles/	Surveyed the Greyson Bugs Salvage logging area for weeds. Located 6 weed sites within the project area.

FY04 Herbicide Monitoring		
Site	Target Species	Method/Observations
		This survey was in response to a FOIA request.
8/?/04	Toadflax	New population of D. toadflax in the North Fork of Deep Creek. NE of the NW ¼ of section 34 T8NR4E.
6/9/04	Knapweed	Forest visitor infomed the office that there is knapweed along the lower end of the Cedar Bar trail. The District weed sprayers treated this patch on 6/15/04.
10/01/03---9/30/04	Knapweeds, spurge, toadflaxes, thistles, houndstongue, orange hawkweed, common tansy, henbane.	
Roadside: Belts	Toadflax, spurge, hawkweed, common tansy, houndstongue, knapweeds,	<p>Magpie Road #425 all segments  Hellgate to the Argo Mine  Avalanche road # 359 FS boundary to Magpie, and Nary time Gulch  Whites Gulch rd. 587 and Springs Gulch rd. #1020  Confederate road #4161FS boundary to **Wagner Gulch plus all open roads in Vermont Gulch, Priest Gulch, Beaver Dam and Lambing Camp.  Cement Gulch, Kentucky Gulch, Bridge Gulch, Thomas Dredge,  Blacktail Gulch #4171,  Atlanta Cr. #575, including Pickfoot, Camas Ridge, and trail 140.  (**these roads were treated with KV dollars)  Duck Creek road #383 from the White Sulphur Springs side to the FS boundary on the Duck Creek side.  Gypsy Lake day use road and Campground road.  Thompson Station road to the end.  North Fork of Deep Cr. #423 to the E. Fork of Cabin Gulch.  Holloway Road, Nield road #4178, Ray Creek road, Trail 107 through section 34.  Spur road on the East Fork of Cabin south and parallel to the main road.  Deep Creek Highway #12. Sulphur Bar road # 4187, Blacktail # 4190, Klondike Pass, Grassy Mt. road #583  Dry Cr. Road, Timber Gulch road and the road under the power lines.  These 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</p>

FY04 Herbicide Monitoring		
Site	Target Species	Method/Observations
		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.
Helena		
Cave Gulch Fire Area	Dalmatian toadflax, leafy spurge.	Twenty herbicide effectiveness plots have been read since 2001. Pre and post fire evaluations collecting photo points, stem densities, rooted frequencies, canopy coverage and GPS locations are documented. To date, treatments display a range of 70 to 90% control.
Elkhorn Mtn. Range Crystal Creek	Tall buttercup	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored.
Elkhorn Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, hounds-tongue	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Isolated back country infestations continue to spread.
Belts Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Areas of infestations have continually grown. Level of treatment doesn't meet annual spreading rate.
Divide Mtn. Range	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed,	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Areas of infestations have continually grown. Level of treatment doesn't meet 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. Areas of infestations have continually grown. Level of treatment doesn't annual spreading rate.
Elkhorn, Belts, Divide, and Blackfoot road right of ways	Spotted knapweed, Dalmatian toadflax, leafy spurge, common tansy, hounds-tongue, Canada thistle, musk thistle, orange hawkweed, oxeyed daisy, henbane	Ocular observations to determine effectiveness and to prioritize treatment areas. Roadside treatment is the number one priority of treatment. Effectiveness of treatments is very high.
Lincoln		
Dry Creek	Yellow toadflax	Photo points established and ocular site condition noted. Treatment and effectiveness will continue to be monitored. Area of infestation has continually grown over the past few years.
Poorman KV	Spotted knapweed Musk thistle	Ocular, this road system was initially treated under the sale contract upon entry. Follow up treatments are

FY04 Herbicide Monitoring		
Site	Target Species	Method/Observations
		being accomplished with KV funding. This road system was highly infested and will require retreatment to reduce the soil seed bank and get this road system in good condition.
Alice Creek	Yellow toadflax	Photo points established to monitor infestation size and effectiveness of treatment. Infestation has remained stable over the past two years.
Moose Creek	Spotted knapweed	Photo points established. Ocular estimates of infestation canopy cover and site description noted.
Road right-of-ways	variety	Ocular observations to determine effectiveness and to prioritize treatment areas.
Trail heads	Spotted knapweed	Ocular observations, Determine application needs and signing. Trail heads on the district have a low level of weed infestations.
Wilson prescribed burn	Spotted knapweed	Ocular, general site condition and infestation size and canopy cover noted.

Weed/Vegetation Monitoring Plots			
Ranger District	Project Area	# of Plots Read	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	Fifty six plots have been established to monitor vegetative changes 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.



Weed/Vegetation Monitoring Plots			
Ranger District	Project Area	# of Plots Read	Comments
Helena	Beaver Creek veg restoration site	Ocular and photo point	Ocular, general site condition, reseeding establishment and canopy cover noted. Herbicide treatment and follow-up seeding on eroded delta fan infested with spotted and diffuse knapweed.

*Monitoring Methodology:*

Various types of monitoring are conducted annually. Ocular and photo points are most popular monitoring methods to assess the big picture, while detailed research plot type plots evaluate the effectiveness of various treatments. Risk analysis and modeling have been performed to identify thresholds across the Forest. These can be found in the Noxious Weed EIS project file and annual reports submitted to the Regional Office.

*Analysis:*

Effectiveness monitoring indicates mixed success. The variability of success becomes grossly evident depending upon species and site characteristics. Effectiveness monitoring has significantly increased since 2001 due to the increased funding. Noxious weed management on the districts increased 10 fold. Herbicide treatment on 15% of inventoried acres contained and controlled weed infestations from increasing across the Forest. Charts (following) 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. Populations have been recorded as able to over winter (survive). Locations of bio-releases appear to be reducing target weed species vigor and rate of spread. Photo points identify reductions in plant density and plant cover.

Significant expansion of the noxious weed program was the result of the 2000 fire season. Budgets gained significantly, providing the foundation for halting weed expansion. A Noxious Weed EIS has been prepared identifying the need for action. The Record of Decision is waiting BE/BA Fish and Wildlife approval. Education, monitoring, research and herbicide, and biological control from 2001 through 2004 have held noxious weeds in check.

**Variability Discussion:**

In 1987 a Noxious Weed EIS was prepared identifying 3,641 acres as 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 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.

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. This includes 43,000 acres burned in 2000.

*Variability Measure:*

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

*Monitoring Results:*

<b>Weed Research</b>			
<b>Principal Investigator</b>	<b>Research Objective</b>	<b>Research Unit</b>	<b>Status</b>
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- 2004
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, and report pending for 2004.
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.
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, and report pending for 2004.
Steve Sutherland, and Jay Winfield	Study four habitat types within the Cave Gulch Fire area to determining the relationship between fire and noxious weeds	RMRS Missoula	Plots read in 2001, 2002, 2003, with conclusion in 2003
Steve Sutherland, and Jay Winfield	Study Telar and Tordon effectiveness in controlling Leafy spurge and Dalmatian toadflax at high and low densities	RMRS Missoula	Plots read in 2001, 2002, 2003, with conclusion in 2003
Dow Agro Sciences and Helena National Forest	Study Tordon and Plateau effectiveness on Dalmatian toadflax under high, moderate and low burn severities.	Dow Agrosiences/ Celestine Duncan	Plots read in 2001, 2002, 2003, with conclusion in 2003

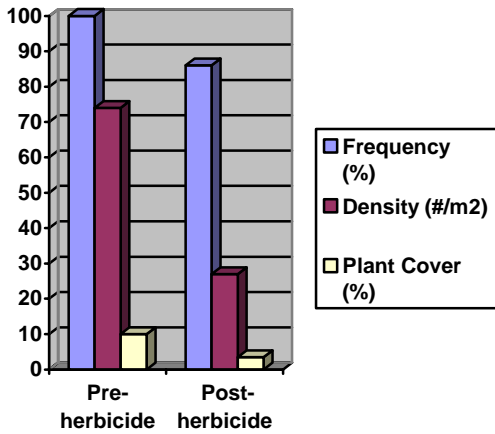


Figure 1 - Leafy Spurge Treated With Telar

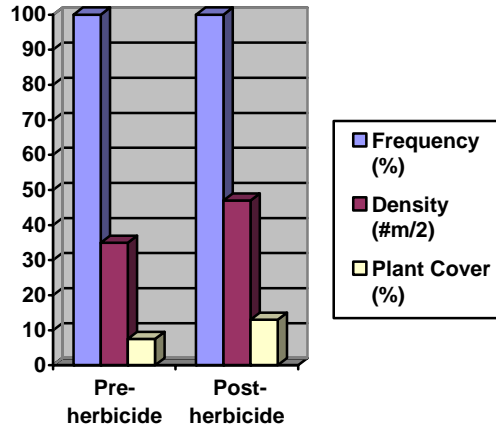


Figure 2 - Leafy Spurge Treated With Tordon

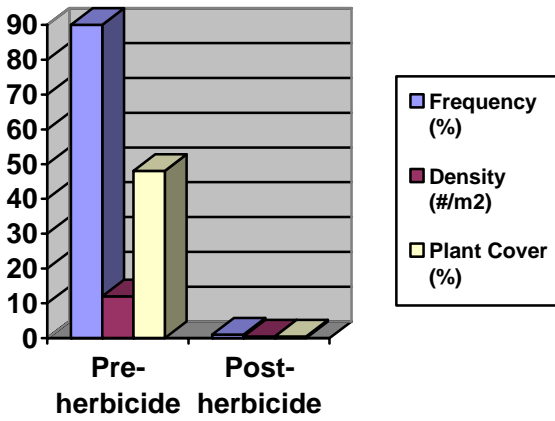


Figure 3 Toadflax Treated With Telar

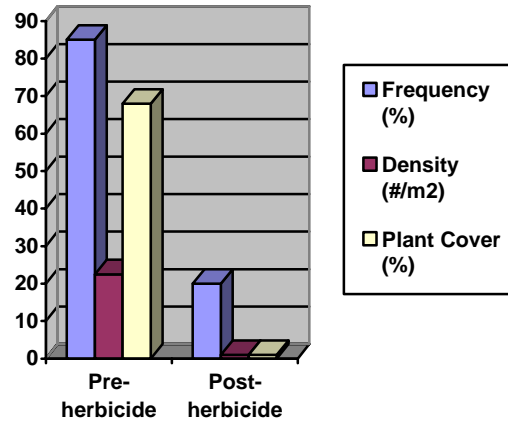


Figure 4 Toadflax Treated With Tordon

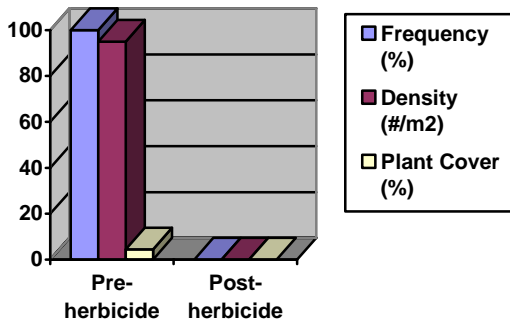


Figure 5 knapweed Treated With Tordon

***Assessment:***

The Helena National Forest is implementing noxious weed management activities well beyond the parameters identified in both the 1986 Forest Plan and 1987 Noxious Weed EIS. Even though districts were operating beyond their legal limitations, the Helena National Forest (ID Team) made a decision to continue managing noxious weeds with a greater emphasis. Project-specific NEPA documents (timber and fuels) on the Forest addressed 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 rated of spread based on research) of the total Forest acres.

**Recommended Efforts:**

The Record of Decision on the Noxious Weed EIS needs to be released and implementation needs to start in 2006. Funding should be increased 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) Condition and trend of range and forage availability****Forest Plan Requirements:**

FSRAMIS, allotment inspection records, transect data, photo plots, wildlife surveys, and burn area monitoring are to be completed in order to identify long term changes in range condition and trend, recommend change in management strategies and /or stocking levels, and to determine encroachment by conifers/brush into grasslands.

**Current Efforts and Findings:**

Monitoring includes photo plots, allotment inspections, and both long term and short term transect data. All the data collected is stored in the 2210 files or separate long term trend transect files. These are used to make management and/or stocking adjustments as necessary.

No long term trend riparian transects were set up in 2004. However, a contractor did reread the Parker 3 Step transects in the North Crow allotment during the field season.

Encroachment by conifers into rangelands continues and in some areas has probably met or exceeded a 5% increase over the past 10 years. It has been identified as a concern in the Clancy Unionville Allotments (Clancy Unionville EIS) and the Elkhorns (Elkhorn Vegetation Study, 2006).

It should be noted that FSRAMIS database is now obsolete and has been replaced by INFRA. Even though databases have changed, the intent of this monitoring item is still being met because the two databases track similar items.

**Recommended Efforts:**

The Forest will continue to set up baseline trend transects per allotment management decisions or as needed through ESA consultation.

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**(D5) Permit compliance****Forest Plan Requirements:**

Allotment inspections are to be monitored to insure livestock used complies with range readiness, proper utilization, and permit requirements.

**Current Efforts and Findings:***General Monitoring Activity*

Full compliance monitoring and documentation were completed on 30% of Forest allotments. This included all allotments that have grazing standards to meet bull trout consultation requirements (26) and other allotments (12 out of 100). The Forest range personnel prioritize allotments for the intensity of compliance inspection. Therefore, the 12 allotments out of the total were inspected for compliance at a higher intensity than the remainder. Goals to complete compliance monitoring were not totally met this year due to lack of adequate documentation or field inspections and the lateness in getting the letters out to the permittees. Documentation is located in field diaries and photos, which are available, and on file, at the Ranger district office. Specific measurements are also found in INFRA by pasture. Compliance for corrective actions from the previous year Notice of Non-Compliance's was the highest priority for compliance monitoring. All but one of the 5 permittees met the corrective action requirements. These allotments will still be a high priority for inspection until district personnel are satisfied that the permittees understand what is expected to maintain the permit. The one allotment where the compliance was not met will have a portion of the permit cancelled and another portion suspended until compliance is achieved. Four Notices of Non-Compliance letters were sent to permittees on allotments besides those from 2003.

**Variability Discussion:**

This monitoring element is annually met approximately 60-70% of the time – either through range readiness or allotment inspections based on the following items.

All 77 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 authorized 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 the 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.

If there is a cool, wet, spring, most allotments are checked for range readiness prior to livestock entering the forest. During normal years, allotments in higher elevations are checked for range readiness.

Since the beginning of the drought cycle in 2000, 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 of season of use) without it counting towards the 3 out of 4 years of personal convenience non-use in a ten year period, to protect the resource. Many permittees have taken advantage of the resource protection non-use. They will either come on the forest later than the on-date, take less numbers than permitted, or come off early. This gives the permittee the flexibility to do what is best for the resource. There has

been a 10% change from the annual operating instructions (plan) because of resource protection non-use. 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 the amount of non-use they voluntarily took.

#### Recommended Efforts:

Allotments will continue to be prioritized by Biological Opinion/Consultation priorities west of the Continental Divide and noncompliance problems east of the divide. This is a BFES target and will be something that is continued and planned annually. There is a need to work on consistency across district boundaries. District personnel will continue to prioritize compliance allotments and follow up on problem areas with appropriate documentation.

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

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### **(E1) Regulated volume prepared for sale**

#### Forest Plan Requirements:

Ten-year sale program, quarterly cut and sold, and accomplishment reports are to be monitored to insure that the base harvest schedule is followed and that the 10-year timber sale schedule is adhered to.

#### Current Efforts and Findings:

##### *Monitoring Activity:*

Helena Forest timber sale program statistics are compiled at the Regional Office. Monitoring is accomplished through maintenance of the timber sale database, Sale Tracking and Accomplishment Reporting (STARS).

##### *Analysis:*

Change in Volume (+/- 10%)

The past 5-year average accomplishment for the Helena National Forest is 4.6 MMBF of a 14.2 MMBF financed program.

Since 1986, the HNF has averaged an accomplishment of 9.1 MMBF of a 14.4 MMBF financed program.

According to data base records, no more than 25% of the timber sales accomplished were outside the area identified with in the Forest Plan 10-year schedule. (Appendix V). However, since the mid 90's the HNF has maintained a 5-year plan instead of a 10-year plan. A 5-year plan allows the Forest to be more responsive to changing conditions (agency direction, ESA listings, agency priorities e.g. National Fire Plan, appeals, lawsuits, and court rulings).

##### *Monitoring Methodology:*

Region 1 Timber Sale Program Statistics and TSMRS.

#### Variability Discussion:

##### *Variability Measure:*

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

*Monitoring Results:*

Timber sale program statistics indicate that in FY04, the Helena National Forest accomplished 5.0 MMBF (5.0 MMBF roaded, 0.0 MMBF inventoried roadless) of a 15.0 MMBF financed program, which included a combination of personal use firewood, post and pole, and commercial sawlog sales.

*Assessment:*

Harvest volume variability exceeds plus or minus 10% of the Forest Plan base harvest schedule.

In review of the decision flow diagram in the HNF Forest Plan, the variability exceeds acceptable limits and is a reoccurring variation. Direct effects (management oriented) on the HNF's ability to adhere to a 10-year schedule include recent large scale wildfires, fuels related programs, and less emphasis on timber production on timbered lands. A shift in emphasis 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.

Region One Forests are in the process of revision. The Helena National Forest is in the next group of R1 Forests due to initiate revision. The reduced harvest level does affect Forest Plan anticipated timber outputs and possible PNV estimates. However, any environmental or other resource impacts anticipated due to timber harvest, will be lessened as a result. This issue will be addressed during revision with no need to immediately amend.

Policy has established that the ten-year sale program is an upper ceiling rather than a required output and therefore, 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:**

Sale review, EA's, EIS's cruise summaries, and TSMRS are to be monitored 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.

*Intent:*

The intent of this monitoring is to monitor the assumptions regarding forest management during the development of the Forest Plan.

**Data Sources:**

Sources of data include sale reviews, environmental documents, cruise summaries and TSMRS.

## Current Efforts and Findings:

### *Monitoring Activity*

Items 1-3 are not being evaluated by the Forest, but are instead being evaluated by the Regional Office. Item 4 is monitored through stand exams and age projections associated with the recent analyses. Item 5: tractor and cable systems are in use in approximately the same ratio as projected. Item 6: review if the current schedule of harvest is correct.

### *Analysis:*

A sale review of the Grassy Bugs Timber Sale was completed by members of the Forest Leadership and ID Team. The purpose of this trip was to monitor implementation of the Grassy Bugs CE. Monitoring item five was considered in this review and results were consistent with the expectations of the Forest Plan.

## Variability Discussion:

### *Variability Measure:*

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

### *Monitoring Results:*

Item 1 deals with lumber recovery, and mill studies have not resulted in changes to yield tables, indicating that those used in the Forest Plan are appropriate. Items 2 and 3 are being approached as a long term Region 1 study with permanent growth plot data. All sale reviews monitored during the last five years indicated that stand structure, density and size were within the variability of the models used in the Forest Plan. Over the same time period there has been no change in forest prognosis models that would indicate a yield table change. Volume and yield tables are correct. Forest Plan working groups continue to reflect forest productivity associated with forest habitat type groups. Condition Class assignments do accurately reflect forest tree size classes. Item five, yarding systems, are within the acceptable variability limits. In addition, helicopter yarding, though more expensive than other yarding systems, is economically feasible. As discussed in Forest Plan monitoring item E1, regulated volume prepared for sale and below, the Forest does not meet the variability measure.

### *Assessment:*

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 is not a target, but a ceiling. Deviations below Forest Plan projections are acceptable.

NFMA analyses have indicated the warm and dry forest type has missed multiple fire cycles due to fire suppression. Increasing fuels in this forest type is increasing the risk of high intensity forest fires. Wildfires on the Forest have burned far more than what was considered likely during development of the Plan. Since 2000, 10% of the Helena National Forest has burned. Across the west, including the Helena National Forest, insect populations have increased dramatically, apparently in response to the continuing drought.

## 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:

Silvicultural prescriptions, EA's, and TSMRS 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.

#### *Intent:*

The intent of this Forest Plan requirement is to focus on continued monitoring of silvicultural assumptions.

#### Current Efforts and Findings:

#### *Monitoring Activity:*

Activities include; silvicultural prescriptions, environmental analyses, and TSMRS (including a review of the Forest's silviculture program).

#### *Analysis:*

Silvicultural prescriptions are based on Forest Plan direction and management area standards during the design of the project.

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. Generally 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.

#### Variability Discussion:

#### *Variability Measure:*

Silviculture program review questions the validity of silvicultural assumptions+ or – 15% of the Forest averages.

#### *Monitoring Results:*

Unevenaged management has generally been applied to warm and dry forests as are found in elk winter range. Evenaged management is applied to higher elevation, cooler forests such as elk summer range in Snow Talon, Greyson Bugs and Grassy Bugs. At this time there is no apparent reason to change rotation age and CMAI. These calculations would be monitored at the Regional level in conjunction with permanent plot analyses. Silvicultural prescriptions for both harvest and prescribed fire are prepared during project analysis and implementation on the ground is consistently reviewed. Current projects include Snow Talon and Clancy Unionville EIS's, and Greyson Salvage and Deep Creek CE's. Implementation and prescriptions are monitored and adaptive management is applied to future projects.

Site specific monitoring of prescribed fire units on Bull Sweats continues to demonstrate increased vigor of understory vegetation. Some leave-tree mortality (less than 1%) has been observed and is probably a result of a weakening of the tree due to damage to the mycorrhizal fungi that had intruded into the pine needle mat which was burned.

#### *Assessment:*

Current silvicultural prescriptions involve both timber harvest and prescribed fire.

Some prescribed burn units have resulted in greater overstory mortality than was anticipated. Mechanical removal of fuels prior to burning provides more satisfactory prescribed burning results. Heavy fuel loadings and steep slopes create difficult conditions to utilize prescribed fire as an effective management tool.

**Recommended Efforts:**

Involvement of silvicultural staff and prescriptions in any project that involves vegetative manipulation should be continued. Continue close silvicultural involvement in implementation and monitoring completed projects. Continue to monitor prescriptions for accomplishment of desired results.

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**(E4) Firewood removal****Forest Plan Requirements:**

Insure that potential firewood from timber sales and road building is made available to the general public before slash disposal.

*Intent*

The intent of this requirement is to make firewood available to the public.

**Current Efforts and Findings:***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.

*Analysis:*

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 Baldy 8, Poorman, Black Butte, Grassy Bugs, Maudlow Toston Salvage, and Cave Gulch Salvage timber sales.

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

Annually, firewood will be made available from 75% of all 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 offered increased firewood gathering opportunities.

There were no commercial firewood sales in FY 2004.

*Assessment:*

The Forest is within compliance with the variability measure for firewood management.

**Recommended Efforts:**

Continue proactive firewood management opportunities.

The Healthy Forest Initiative Categorical Exclusion allows the Forest to be more responsive to small sale and firewood sale opportunities.

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## **(E5) Size of openings**

### **Forest Plan Requirements:**

Timber Sales and prescribed burns are monitored to insure that openings conform to standards.

#### *Intent*

The intent of this requirement is to insure that forest management practices comply with the environmental analyses they are tied to.

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

#### *Monitoring Activity:*

Individual environmental documents and on-the-ground implementation are monitored by the Forest Silviculturist to insure that opening sizes conform to standards.

#### *Analysis:*

Several projects, such as Wagner Atlanta, Bull Sweats, and Poorman have recently had ID team and administrative reviews. In these projects implementation area unit size was similar to the size analyzed in the environmental documents.

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).

### **Variability Discussion:**

#### *Variability Measure:*

Unacceptable results of an ID team or administrative review.

#### *Monitoring Results:*

In 2004 the Greyson Salvage timber sale created two openings greater than 40 acres. Unit 1 is 131 acres and Unit 2 is 42 acres. Regional Forester approval was granted for these evenaged openings greater than 40 acres in size. The public was notified of the unit size in the scoping letter for the project.

#### *Assessment:*

The size of unit openings is in compliance with the Forest Plan and variability measure.

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.

### **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:**

Insure that regenerated yield projections are correct.

*Intent*

The intent of this requirement is to model growth and yield projections in areas of past harvest. This will insure sustainable harvest rates. Permanent plots in regenerated stands are monitored to insure that regenerated yield projections are correct.

**Current Efforts and Findings:***Monitoring Activity:*

The TSMRS database was queried for plot installation or plot measurement activity.

*Monitoring Results:*

No permanent growth plots were established or measured in 2004.

**Variability 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.

*Analysis:*

Thirty-three permanent growth plots have been establish across the Forest, 19 since 1986. Of the 33 plots, 14 plots are now being maintained and remeasured. For consistency in data collection across the Region, the Regional Office took responsibility of establishment and remeasurements 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 remeasure all plots on every Forest. At this time, 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.

*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. It has also been determined, by the Regional Office, that plots will be remeasured on a ten year frequency, rather than five year frequency.

Fewer than the projected number of permanent plots have been established as a result of management actions intended to develop a better, more efficient, and statistically valid sampling model.

A modified statistically valid sampling design has been implemented throughout the Region to establish and monitor permanent plots in regenerated stands (including stands on the Helena National Forest).

**Recommended Efforts:**

Continue to work with the Regional Office with growth and yield monitoring.

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**(E7) Reforestation practices and assumptions****Forest Plan Requirements:**

Silvicultural prescriptions, reforestation records, post sale administrative review and TSMRS are monitored to insure that 1) regeneration is obtained within 5 years after final harvest cut, and 2) scheduled planting is accomplished.

**Current Efforts and Findings:**

Reports are available in TSMRS.

*Monitoring Activity:*

Reforested stands are measured 1, 3, and 5 years after site preparation to monitor reforestation. Timely planting of stands is scheduled if the stand is not on its reforestation trajectory.

*Analysis:*

Exam information is used to compare desired/targeted reforestation conditions. This information is compiled and available thru the TSMRS database.

The Regional Office generally conducts an annual review of reforestation indices. However, this review was not accomplished for 2004 due to the transition to a new database.

The Fires of 2000 and 2003 burned about 10% of the Forest. These fires generated a need to plant seedlings on about 5,000 acres. To date, 1,243 acres of the burned areas have been planted. Reforestation monitoring was accomplished in 2004; most areas are successfully regenerating although drought stress was noted in some plantations.

**Variability 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.

*Monitoring Results:*

Reforestation requirements within 5 years continue to be successful, with about a 95% success rate. Planting has been accomplished as recommended in silvicultural prescriptions and post harvest monitoring exams.

*Assessment:*

In two years the Forest planted less than 50% of the acreage projected annually by the Forest Plan; in year 2000 (130 acres) and year 2003 (94 acres). Additionally, the Forest did not plant 75% of the 5 year acreage the Plan projected. The Forest planted 2,185 acres during the past five years, or 73% of the Plan's projection.

A deviation of management practices is observed, however, this variability is within acceptable limits. Planting will continue to be used as a reforestation tool and will be reevaluated at the next monitoring period.

The tree planting program on the Forest is reflective of the Timber Sale program. The annual sale quantity is a ceiling not a target, the planting program is dependent on harvest to attain its ceiling for tree planting.

Harvest of active timber sales is sometimes delayed by market forces or natural events such as severe fire seasons. If a unit scheduled for planting is not harvested on schedule then the planting is delayed.

Stands needing planting in fire salvage sales have been planted, but general funding for reforestation of all burned lands needing planting is not available to the Forest Service.

#### 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:

Silvicultural prescriptions and accomplishment reports are to be reviewed annually in order to insure scheduled TSI projects are accomplished, and that timber stand improvements and assumptions are valid.

#### Current Efforts and Findings:

##### *Monitoring Activity:*

Reports were queried from The Timber Stand Management Record System (TSMRS).

##### *Analysis:*

In the past 5 years the Forest has thinned 60 acres. The stand is located in Vermont Gulch in the Big Belt Mountains.

#### Variability Discussion:

##### *Variability Measure:*

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

##### *Monitoring Results:*

No thinning was done in FY 2004.

##### *Assessment:*

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 4% this goal.

Annually the Forest has accomplished less than 50% of the thinning objective.

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. A deviation of management practices is observed.

#### Recommended Efforts:

We recommend finalizing the lynx amendment for Northern Region and choosing an alternative that would provide flexibility for timber stand improvement. The amendment is in draft format and should be finalized in 2007.

A database review of precommercial thinning opportunities has been conducted to implement thinning in areas of greatest need. All TSI projects within Lynx habitat are pending.

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### (E9) Lands suitable for timber production

#### Forest Plan Requirements:

Lands suitable for timber production are to be monitored in order to evaluate accuracy of suitable timberlands classification in the FP, and to 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 include environmental analyses; stand exams, project plans, and timber planning.

##### *Intent*

The intent of this requirement is to evaluate and monitor suitable lands as well as lands not suitable for timber production.

#### Current Efforts and Findings:

##### *Monitoring Activity:*

The accuracy of suitable timberlands classification should be evaluated using the timber planning process, stand exams, and environmental analyses. Suitability is considered during the preparation of site-specific silvicultural prescriptions.

##### *Analysis:*

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.

In summary, 238 acres were deemed suitable per the evaluation process and in review it was determined that 100 acres be removed from timber production emphasis as the land did not fit with the management area goals and harvest may have caused irreversible resource damage.

##### *Monitoring Methodology:*

Review of 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.

#### Variability Discussion:

##### *Variability Measure:*

+/- 5% change in acreage of suitable lands.

*Monitoring Results:*

No silvicultural prescriptions were prepared in 2004 which included site specific recommendations to change suitable timber lands.

*Assessment:*

A review of the amendments for the Forest Plan was completed. The following amendments contained changes to existing Forest Plan management allocations:

Amendment	Acres	From	To
5	130	M-1	T-1
8	100	T-1	W-1
9	40	M-1	T-1
18	39	M-1	T-1
18	20	M-1	T-2
18	9	M-1	T-3

**Recommended Efforts:**

Continue to evaluate land suitability at the project level and recommend Forest Plan amendments as necessary

**(F) Soil and Water****(F1) Compliance with local, state, and Federal water quality standards****Forest Plan Requirements:**

Monitor for compliance with local, state and Federal water quality standards.

*Intent:*

Insure compliance with local, state, and Federal water quality statutes.

**Data Sources:**

Data sources include 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:***Monitoring Activity:*

The Youth Forest Monitoring program for 2004 monitored twelve different streams on the forest for temperature, pH, dissolved oxygen, conductivity, and macroinvertebrates. In addition, channel cross sections, pebble counts, and sinuosity were done.

Monitoring of the Toston/Maudlow fire and salvage sale also continued with water quality stations on Deep Creek and Sulphur Bar Creek. Flow measurement, suspended sediment samples, and bedload were



collected for both sites, An automatic stage recorder and ISCO sediment sampler were operated at the Deep Creek site.

Monitoring also occurred on Magpie Creek as part of the negotiated settlement for the Cave Gulch fire and salvage sale. Discharge, suspended sediment, and bedload were collected at least six times on the rising and falling portion of the hydrograph.

In anticipation of the Snow-Talon salvage sale, the water quality monitoring station at Copper Creek was reestablished. 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.

*Analysis:*

The Youth Forest Monitoring concluded that, in general, the streams are in good health. However, there are concerns, and all of the streams should continue to be monitored.

The sediment analysis, for the Toston/Maudlow salvage sale indicated that the amount of total sediment was significantly less (77% less) than what it was in previous years. The stream 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 2003 and 2002. The effects from the salvage logging appear to be negligible.

Copper Creek showed surprisingly small amounts of sediment coming from the burned landscape. It was far less than anticipated and Copper Creek remained clear except for one rainstorm, which produced a large percent (28%) of the total sediment load for the year in one day.

**Variability Discussion:**

*Variability Measure:*

Variability which would initiate action- Activities not meeting water quality standards or that would lead to long-term watershed degradation

*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.

*Assessment:*

The Forest is within compliance with the variability measure for compliance with local, state, and Federal water quality standards.

*Actions in response to variability assessment:*

Within variability, no action is required.

**Recommended Efforts:**

Continue with Youth Forest monitoring efforts and the four water quality stations listed above.

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**(F2) Soil and water improvement projects****Forest Plan Requirements:**

Soil and water improvement projects

*Intent:*

To eliminate backlog of soil and water restoration acres by year 2000.

**Data Sources:**

Project EAs and accomplishment reports. Soil and water improvement projects are monitored through accomplishment reports to eliminate backlog of soil and water restoration acres.

**Current Efforts and Findings:***Monitoring Activity:*

The Grouse Gulch watershed restoration project associated with the Cave Gulch salvage sale was monitored this year.

*Analysis:*

This watershed restoration project was accomplished.

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

Variability which would initiate action - < 80% accomplishment of target in 5 year period.

*Monitoring Results:*

The Forest has 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.

*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.

**Current Efforts and Findings:***FY04 Monitoring Activity 1:*

The Forest Soil Scientist conducted field assessments of soil conditions in areas where proposed vegetation treatment units in the Snow Talon Fire Salvage Project Area overlap with past harvest units. Areas sampled included portions of ten past timber harvest units, and were compared to samples from adjacent un-harvested areas, which served as the baseline data. Data from these field reviews serves as information to document current soil conditions, and to compare for trends in soil conditions resulting from future implementation of vegetation management activities.

*FY04 Analysis 1:*

The full report summarizing the findings of these field reviews conducted during September and October 2004 is on file at the Helena National Forest Supervisor's Office. This full report includes documentation of the monitoring methodology and limitations, data collected, and results of the monitoring data analysis. Key conclusions are recounted below in the Variability Discussion.

*FY04 Monitoring Activity 2:*

Soil monitoring was conducted in six post-fire salvage harvest units within the Cave Gulch Post-fire Salvage Sale Area to assess implementation and effectiveness of key Best Management Practices for soils following salvage harvest. This soil monitoring was implemented through a Region 1 Soil Administrative Study in partnership with the Rocky Mountain Research Station (USDA Forest Service Research Branch) in Moscow, Idaho.

*FY04 Analysis 2:*

Soil monitoring data collected in the Cave Gulch Post-fire Salvage Sale Area, as part of the Region 1 Soil Administrative Study, is currently being compiled at the Rocky Mountain Research Station (RMRS) in Moscow, Idaho. When the field monitoring for this regional administrative study is completed in summer 2005, soil data from the Helena National Forest will be analyzed by research scientists at RMRS along with soil monitoring data from other National Forests in Region 1. RMRS scientists plan to publish results of this administrative study in a general technical report in FY07.

**Variability 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%. The Forest Plan provides no additional detail on how this measure of soil variability is to be evaluated.

*Monitoring Results:*

Recent guidelines on how to measure soil variability are provided in Forest Service Manual 2500, Chapter 2550 - Soil Management (FSM 2500, R-1 Supplement 2500-99-1, Effective 11/12/1999). 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 aerial extent of "detrimental" soil disturbance within "activity areas" (i.e. timber harvest units). This direction in FSM 2500 is used for specifying how the Forest Plan measure of soil variability (i.e. 20%) should be evaluated:

- When site-specific soil properties change more than 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 aerial extent of soil impacts exceed the Forest Plan measure of soil variability.

For monitoring in Snow Talon Fire Salvage Project Area, 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.

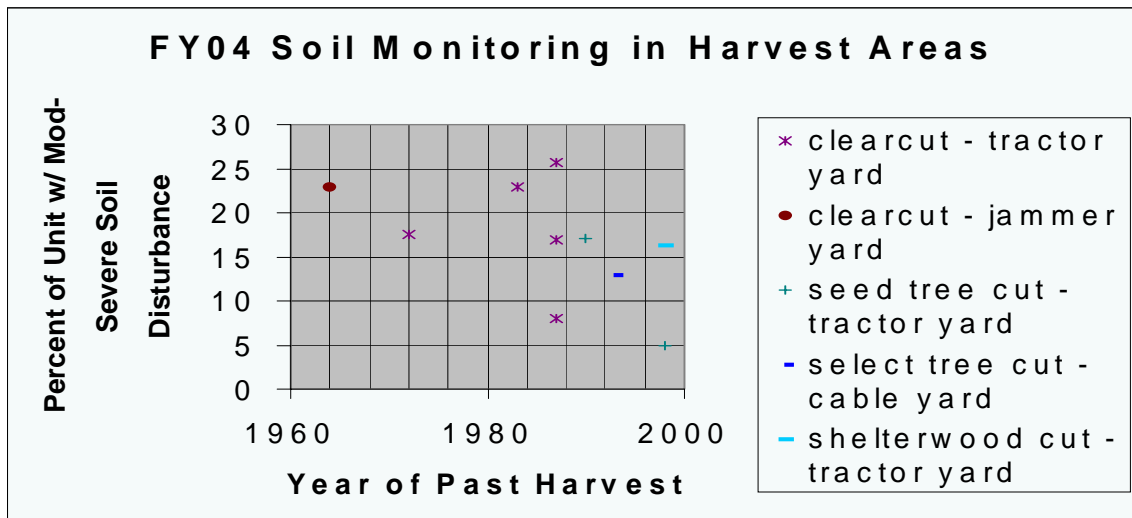
In Snow Talon Fire Salvage Project Area, results of monitoring in past harvest units document the magnitude of soil compaction, which is one of several types of soil disturbance evaluated. In 7 of the 10 sites evaluated, the magnitude of soil compaction is statistically significant, with a 95% confidence interval:

- With the one-way analysis of variance (ANOVA) tests, 4 of the 10 monitoring plots showed statistically significant change in soil penetration resistance for soils disturbed by skid trails and logging roads associated with past harvest compared to undisturbed soils (see table below). This statistically significant change indicates the magnitude of soil compaction resulting from past harvest activities constitutes detrimental disturbance for these four harvest units.
- With the one-way analysis of variance (ANOVA) tests, 4 of the 10 monitoring plots showed statistically significant change in soil bulk density for soils disturbed by skid trails and logging roads associated with past harvest compared to undisturbed soils (see table below). This statistically significant change indicates the magnitude of soil compaction resulting from past harvest activities constitutes detrimental disturbance for these four harvest units.

Results of this monitoring also show that forestry practices have generally become more effective in limiting the amount of area affected by detrimental soil disturbance to comply with the Forest Plan measure of soil variability (i.e. 20%), since adoption of forestry Best Management Practices (BMPs) in 1988 (see graph below).

- Six of the monitoring plots assessed areas harvested prior to adoption of BMPs in 1988. The mean value for aerial extent of moderate to severe soil disturbance on these 6 plots was 19%, and ranged from 8% to 26%.
- The remaining 4 monitoring plots assessed areas harvested after 1988 and adoption of BMPs. The mean value for aerial extent of moderate to severe soil disturbance on these 4 plots was 13%, and ranged from 5% to 17%.

Monitoring Plot #	Snow Talon Proposed Salvage Harvest Unit #	Method of Past Harvest	Year of Past Harvest	Aerial Extent of Detrimental Soil Disturbance (% of Area)	Meet or Exceed Forest Plan Variability	ANOVA – Statistical Significant Change, Soil Penetration Resistance	ANOVA – Statistical Significant Change, Soil Bulk Density	Harvest Before or After Adoption of BMP's
04SF010	14	Clearcut – jammer yard	1964	23	Exceed	Yes	No	Before
04SF008	21	Clearcut – tractor yard	1987	26	Exceed	No	Yes	Before
04SF009	71	Clearcut – tractor yard	1983	23	Exceed	No	No	Before
04SF005	27	Clearcut – tractor yard	1972	18	Meet	No	Yes	Before
04SF004	44	Clearcut – tractor yard	1987	17	Meet	No	No	Before
04SF007	18	Clearcut – tractor yard	1987	8	Meet	Yes	No	Before
04SF002	104	Seed tree cut – tractor yard	1990	17	Meet	No	No	After
04SF003	51	Seed tree cut – tractor yard	1998	5	Meet	Yes	Yes	After
04SF006	7	Select tree cut – cable yard	1993	13	Meet	Yes	No	After
04SF001	80	Shelterwood cut – tractor yard	1998	16	Meet	No	Yes	After



In conclusion, results of this monitoring document the magnitude of soil compaction is statistically significant, and is thus considered "detrimental" soil disturbance, in 7 of the 10 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" affect less than 20% of the area in the evaluated units that were harvested after adoption of BMPs in 1988.

*Assessment:*

The results indicate that the adoption and implementation of BMPs in 1988 fulfilled the Forest Plan direction to initiate actions responding to harvest activities exceeding the Forest Plan variability of 20% change in soil properties prior to 1988. There is no need for current management action, since monitoring indicates BMPs have been effective in limiting "detrimental" soil disturbance to comply with the Forest Plan soil measure of variability for 20% change.

*Actions in response to variability assessment:*

Within variability, no action is required.

**Recommended Efforts:**

No recommendations at this time.

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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:**

*Monitoring Activity:*

Continued to monitor the last remaining case in Basin 41I. Water rights for Snowbank Lake were also investigated.

*Analysis:*

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. It was discovered that no statement of claim was filed for the water right for Snowbank Lake water diversion and that the Forest has lost its water right for that diversion. A possible water rights transfer or new water right is being investigated for this site.

**Variability Discussion:**

*Variability Measure:*

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

*Monitoring Results:*

The State is currently in a statewide adjudication and all water rights are reviewed as part of each basin's temporary preliminary decree or preliminary decree. Individual projects are reviewed as to whether additional water rights need to be acquired. We are currently working on one acquisition for Snowbank Lake.

*Assessment:*

The Forest may have to acquire (re-acquire) water rights on Snowbank Lake.

*Actions in response to variability assessment:*

Work through the Statewide adjudication process for Snowbank Lake.

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**Additional Water and Soil Monitoring: Post Fire Assessment****Burned Area Emergency Response Treatments**

The Burned Area Emergency Response Report (available in Supervisors office) for the Snow-Talon fire stated that we would treat 653 acres of weeds; install drainage structures on trails within the burned area; install proper sized culverts or bridges, drain dips and various other erosion control measures on the roads within the burned area; and remove hazard trees on 197 acres of land adjacent to roads.

*Treatments Accomplished*

In the Snow-Talon burned area, 151 acres were sprayed for weeds, ten miles of trail were sawed out with 25 feet of puncheon installed and 15 water bars placed, 197 acres of hazard trees were removed; and all of the drainage control and bridge/culvert work was accomplished.

*Monitoring*

Effectiveness monitoring will occur in the spring of 2004 to assure that drainage controls on roads and trails are adequate and that weed controls were effective. In addition, implementation monitoring will occur to insure that treatments that did not get accomplished in 2003 will be accomplished in 2004. This will include additional weed treatment and additional erosion control on trails within the burned area.

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**(G) Minerals****(G1) FS land uses that may affect minerals activities****Forest Plan Requirements:**

EA's, operating plans, prospecting permits, lease applications and reviews by ID team are used to monitor FS land uses that may have an effect on mineral activities and mineral activities that may have an effect on surface resources.

*Intent:*

The intent is to check that stipulations are adequate to protect resources but are not severely restrictive; and conversely, to check that resources are not severely restrictive on the mineral activities. Ten reviews are to be completed annually. Any departure from approved operating plan or violation of assigned stipulations; unacceptable review of lease application by ID team; or unacceptable restrictions on mineral development will initiate action.

## 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 is expected to be completed in the Fall of 2005.

Small scale placer prospecting activities account for the bulk of the hard rock minerals projects on the forest from 2000-2004. The forest administers between 50-75 of these projects per year with 6-10 new projects annually as well as a similar number that are reclaimed and closed. These projects have been approved with Categorical Exclusions and are generally at 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 have increased project mitigations and Plan of Operations processing timelines for small scale placer projects.

### *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.

### *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 in 2004. The increase appears to be related to residential housing growth in the Helena area. The scale of projects are usually 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 mill-site, 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 17 sites ranging from ¼ 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 8 mine sites on the forest. One



tailings dam located in the Upper Blackfoot watershed on NFS lands. The Forest is working within the CERCLA framework and responsible parties to resolve the long-term issue of this dam.

Historic hard rock mineral sites will continue to result in degradation of headwaters water quality until cleanup efforts are completed.

#### Variability Discussion:

##### *Variability Measure:*

Variability which would initiate action – 1. departure from approved operating plan or violation of assigned stipulations, 2. unacceptable review of lease application by ID team, or 3. unacceptable restrictions on mineral development.

##### *Assessment:*

Helena National Forest permitting and administration of proposed new projects appears to be resulting in adequate protection of resources. The Forest has not received enough new, larger proposals to gauge the degree to which resources pose significant restrictions to minerals activities.

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

Within variability, therefore no action is required.

#### Recommended Efforts:

No recommendations at this time.

## **(P) Protection**

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### **(P1) Acres and volumes in insects and disease infestations**

#### Forest Plan Requirements:

This requirement is to monitor the acres and volumes of insect and disease infestations.

##### *Intent:*

The intent of this requirement is to 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.

To assure that management emphasizes removal of lodgepole pine stands at high risk for mountain pine beetle attack, and to keep ongoing inventory of acres of high risk stands of insect and disease infestations, acres and volumes of insect and disease infestation are to be monitored annually.

#### Current Efforts and Findings:

##### *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, TSMRS, and annual FPM aerial observation.

*Monitoring Results:*

Two categorical exclusions completed in 2004 were within areas currently exhibiting mountain pine beetle activity and include adjacent lands that were mature lodgepole pine stands and at high risk to mountain pine beetle.

**Variability 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.

*Analysis:*

In 2004, the Forest increased insect and disease monitoring efforts in the field, due recent Douglas-fir beetle outbreaks in and near areas that have burned. Approximately 2000 acres were surveyed and increasing activity of this insect was detected.

Trends also indicate increasing insect activity with Douglas-fir being attacked by Douglas-fir beetle and western spruce budworm. Ponderosa pine, lodgepole pine, and whitebark pine are being attacked by mountain pine beetle. Whitebark pine is also being attacked by white pine blister rust.

Red banded needle blight, which defoliates ponderosa pine, continues to be active in the Helena area.

Lophodermella is defoliating some lodgepole pine.

Insect and disease activity is not evenly distributed across the Forest, with some stands having greater activity than others.

*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 Grassy Bugs and Greyson salvage sales.

Due to the increase and spread of insect and disease activity, the Forest is not within the range of acceptable variability. Proactive control measures have been implemented, including pheromone based funnel trapping and the application of anti-aggregative pheromones in high value stands of Douglas-fir (such as old growth and campgrounds).

Anti-aggregate pheromones have also been applied to high value trees and stands of lodgepole pine and whitebark pine.

The Forest is making good progress in selecting whitebark pine that appears to be resistant to white pine blister rust. A regional selective breeding program to develop a rust resistant tree is in progress.

**Recommended Efforts:**

Continue with a proactive and aggressive forest health effort.

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**(P2) Air quality****Forest Plan Requirements:**

Annually monitor air quality through project reports and report annually.

*Intent:*

The intent of this requirement is to assure prescribed fire meets state and Federal air quality standards. This is measured by the standards that State DEQ has outlined in the Montana/North Idaho Airshed Group Operating Guide.

**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.

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.

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

Variation of +/- 10% beyond standards and guides will initiate action.

*Monitoring Results:*

No violations notices have been received to indicate that standards had been exceeded. This information is summarized annually by state DEQ. Measurements are in compliance as determined by DEQ.

*Assessments:*

Variability is within acceptable limits. No change necessary.

**Recommended Efforts:**

Continue current management direction.

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**(P3) Fuel treatment outputs****Forest Plan Requirements:**

Fuel treatment outputs are to be monitored and reported by the Timber Staff Officer annually.

*Intent:*

The intent of this requirement is to assure balanced fuel treatment reporting. This is measured through accomplishment reports annually.

**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.

*Monitoring Activity:*

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.

*Analysis:*

A total of 2,273 acres of natural fuels were treated in FY04.

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

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

*Monitoring Results:*

Fuel treatments have been conducted in a timely manner and accomplishments are tracked in the Timber Stand Data Base for activity fuels and NFPORS for the natural fuels. There is no outstanding backlog of fuel treatments.

*Assessments:*

Variability is within acceptable limits. No change is necessary.

**Recommended Efforts:**

Shift emphasis of monitoring to natural fuel treatment areas.

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**(P4) Wildfire acre projections****Forest Plan Requirements:**

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

*Intent:*

The intent of this requirement is to assure wildfire acres are within projected annual burned acres and determine the adequacy of the fire management organization.

**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.

*Monitoring Activity:*

The 5100-29 Reports compile the individual fire information and are stored in the NIFMID database. These are transmitted and reported annually.

*Analysis:*

Over approximately 18 years of implementation of the Plan, approximately 7,968 acres per year have burned on average. The current five year average is about 17,452 acres burned. See the graph below.

FY04: 23 fires burned 77 acres.

**Variability Discussion:**

*Variability Measure:*

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

*Monitoring Results:*

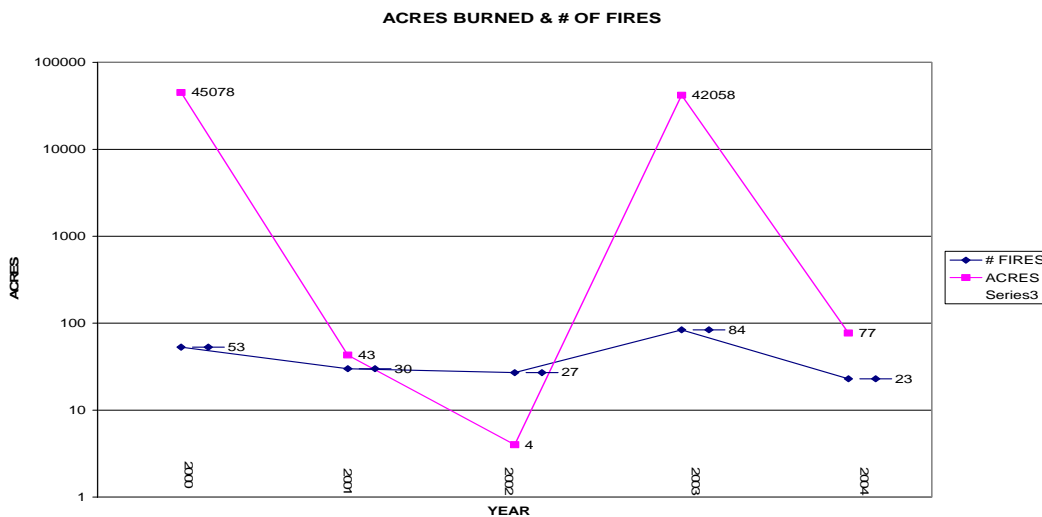
The elevated acres are directly tied to large fires of 1988, 2000 and 2003. The Forest was successful 96% of the time at keeping wildfires to 10 acres or less in 2004.

*Assessments:*

The variability on average is within acceptable limits if you do not count the large fire years of 2000 and 2003 being above the 25% projected average of wildfire burned acres. No change to the monitoring element is necessary at this time.

**Recommended Efforts:**

Continue current management direction which periodically re-evaluates fire staffing needs. Review acre objective at Forest Plan Revision.



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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:*

The intent of this requirement is to keep fire management program costs effective.

**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 in costs.

*Monitoring Activity:*

The NFMAS process has been used for budget submissions for the HNF Fire Program. Costs were derived from Transaction Register. Total allocations were derived from final data.

*Analysis:*

In 2004 the Forest spent \$ 2,109,959 in the suppression of wildfires. The 5 year average is \$7,230,002, which includes the two large fire cost years of 2000 and 2003. See the graph below.

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

Variation of +/- 5% increase in real costs will initiate action.

*Monitoring Results:*

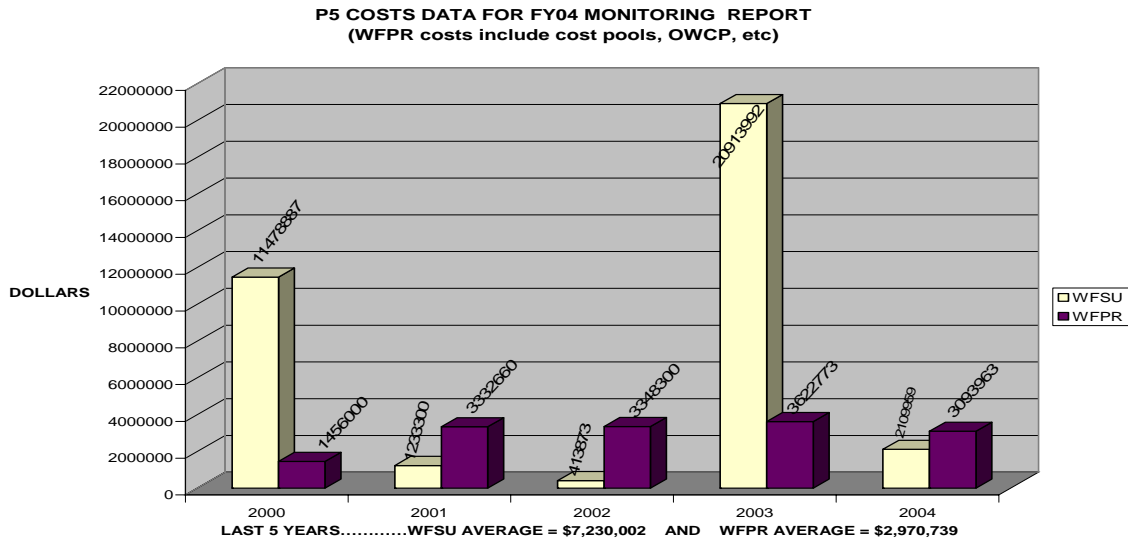
The Forest has increased its dedicated firefighting workforce considerably since the mid-80's. Congress is now funding wildfire suppression at higher levels than in past.

*Assessments:*

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.



## (L) Facilities

### (L1-L2) Roads/Construction and Road management

**Forest Plan Requirements:**

L1 : INFRA Travel Routes inventory, accomplishment reports, EA's, transportation plans, and final construction reports are to be used to insure that assumptions are valid concerning local and collector road density and standards.

L2: Travel Routes Inventory maintenance plans and travel plants are to be used to insure that assumptions are valid concerning yearlong closures, and seasonal closures of collector and local roads. Annual reviews are to be reported every five years.

*Intent:*

These two elements were designed to monitor the road system on the Forest. Element L1 measures the miles of system road and the miles of road constructed each year. Element L2 measures how many of those system road miles are closed either seasonally or year long.

**Variability Discussion:**

*Variability Measure:*

L1 Variation of +/- 20% of predicted miles of road will initiate action.  
 Variation of +/- 30% of miles of predicted roads closed either seasonally or yearlong will initiate action.

*Monitoring Results:*

L1

Resource Element L1 monitors the miles of local roads in place and the miles of collector roads constructed on an annual basis. The variability that would cause action is plus or minus 20% of the predicted road miles. 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 and so the data for those two years should not be considered.

### Helena National Forest Road Information

Year	Miles in System	Miles Closed Yearlong	Miles of Collector Constructed	Miles of Local Road Constructed	Forest Plan Projections, Miles	Forest Plan Projected Collectors & Locals, Miles to be Constructed Each Year
1986	1607	207	6	15.2		
1987	**	**	6.5	16		
1988	**	**	4.8	12		
1989	**	**	3.2	8.1		
1990	**	**	2.6	6.5		
1991	**	**	2.2	5.3		
1992	1680	325	3.3	8.2	1761	+22
1993	1680	325	1	3	1783	+22
1994	1940	568	0.5	0.9	1805	+22
1995	1990	570	**	**	1827	+22
1996	1887	**	**	**	1849	+22
1997	1776	335	0	0	1871	+22
1998	1899	339	0	0	1893	+22
1999	1837	334	0	2	1915	+22
2000	1954	297	0	0	1937	+22
2001*	*	*	0	0	1959	+22
2002*	*	*	0	0	1981	+22
2003	2847	888	0	0	2003	+22
2004	2832	888	0	0	2025	+22

\*In 2001 and 2002 there were database problems.

\*\* Records no longer available.

The Forest Plan anticipated that the total system miles would 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 some of the definitions of a road used in the Forest Plan changed because of a National Forest Service policy change due to 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 standard passenger car vehicles. The 2001 road policy included new standard jeep roads/trails as part of the system, resulting in more miles of road on the National Forest than the 1607 miles that the 1986 Forest Plan assumed. Over the years, many of these roads 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. This effort resulted in routes being added to the system. In 2001 and 2002 the roads database had a flaw that double counted many of these new roads that were added to the system. That is why the numbers for those years are incorrect.

The Forest Plan predicted that we 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 we built that many miles of road. In 1986 and 1987 the total miles of road constructed came close to the prediction (well within the variance of 20%), but beginning in 1988 the miles of road constructed was outside the 20% variance from the predicted 22 miles per year. The miles of road constructed annually fell sharply in the early 1990's and since 1995 almost no new roads have been constructed on the Forest. The predicted miles of new road construction assumed the Forest would be building roads in roadless areas to access timber stands. After the mid-1990's no roads have been built in roadless areas due to changes in national policy and public support. Road construction outside roadless areas has also almost completely stopped, with timber harvest using existing roads, temporary roads or logging systems (helicopter) that don't require closely spaced roads.

## L2

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. We have no way to measure the miles of road closed seasonally on an annual basis, but as the table above shows, we do know the miles with year round closures by year since 1992. 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, so it is safe to assume that if the seasonal closures were added we have generally exceeded the miles closed each year since 1986. These additional miles of closures have come through travel plan decisions that either were attached to a timber sale or were stand alone decisions. Since the Forest Plan was written, there has been an unanticipated surge in motorized recreation on the Helena NF. To control that increased use seasonal or year-long closures have been placed on more roads than had been predicted.

From year 2000 data to the 2003 data (since 2001 and 2002 is unusable due to errors) 893 miles were added to the recorded data that was not recorded in previous years due to implementation of the National Roads Policy in 2001. Prior thought to why these roads were not counted could have been due to assuming these roads were not generally passable by a standard vehicle. They were rough unusable 4 wheel drive "Jeep" roads, and not considered to be used much, if at all. The National Roads Policy changed that and they were added to the Forest Inventory. Once these roads were accounted for, many

roads were decommissioned and/or obliterated, thus the changed number in miles of roads closed year long, as well as the increase of miles in the system.

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. The increase of 893 miles. had that been added to the Forest Plan projection also, 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, and 31% in year 2005.

*Assessment:*

L1 –We're outside the variability limits in recent years. Under the Forest definition of a road, the actual number of miles is under the projected amount under the Forest Plan definition. However, under the 2001 Road Policy definition, the Forest is well within the variability limits.

L2 – Assuming the miles of road open yearlong in 2004 cumulatively represents the situation in the years between 1986 and 2004, we are within the variability limits and no action is needed.

**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.

## Heritage Resources

### 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.

## Current Efforts and Findings:

### *Monitoring Activity:*

In 2004, HNF archaeologists evaluated the condition and integrity of 25 known archaeological and historical sites as part of compliance inventories or separate stewardship projects. These monitoring activities and projects are reported in the forest's annual heritage resource compliance report to the Montana State Historic Preservation Office (SHPO) and the Confederated Salish-Kootenai and Blackfoot Tribal Historic Preservation Offices (THPO).

Monitoring was completed for ten forest projects to determine whether recommended heritage mitigation measures had been devised and/or implemented as prescribed in compliance inventory reports and/or NEPA documentation. This monitoring was primarily focused on range, minerals, and prescribed burn projects.

Six archaeological sites located along the Lewis and Clark National Historic Trail across the Helena NF were monitored in 2004. The condition of the prehistoric-historic trail tread was also inspected.

Carroll College archaeologists conducted a two-week archaeological field school to evaluate the conditions of four identified archaeological sites in the Crow Creek drainage in the Elkhorn Mountains.

Eight previously identified historic hardrock (lode) mining ruins located in the Little Blackfoot River drainage were re-visited and more thoroughly documented in advance of mine waste remediation proposals.

The Helena NF and Lewis and Clark NF collaborated in the development of a draft historic preservation plan for archaeological sites on National Forest lands within the Smith River recreation corridor.

### *Analysis:*

Over 1000 heritage sites are currently identified on the HNF as a result of project and non-project surveys completed since 1978. Annual resource monitoring in 2004 focused primarily on those heritage sites listed on or eligible for the National Register of Historic Places. Heritage resource mitigation measures had been either devised or implemented for seven of the ten monitored forest projects. Mitigation measures have yet to be developed for two range projects. One livestock (spring) development was constructed outside the scope of the design agreed to by the FS and range permittee. Site damage was minimal.

In 2004, livestock grazing atop archaeological sites around natural springs, and in and around old historic homesteading, mining and ranching sites was the most frequently identified impact to heritage resources. The effect of livestock grazing atop the Lewis and Clark National Historic Trail and related sites in the Alice Creek Basin and atop Lewis and Clark Pass was noted.

Dispersed recreation along Crow Creek in the south Elkhorn Mountains was identified as impacting archaeological resources.

2004 monitoring did not identify any heritage sites that had been adversely affected by malicious vandalism, artifact collecting, or illegal digging. However, the historic Moose Creek Ranger Station, which been undergoing restoration over the last 4 years, was the scene of an arson attempt in 2004. Firefighters arrived at the building in time to save it from destruction. The ranger station suffered both structural and smoke damage.

Based on the results of a multi-year monitoring program, in 2004 the HNF and Pennsylvania Power and Light-Montana (PPL) completed erosion control and data recovery-erosion control projects at two archaeological sites in upper Holter Reservoir. The effectiveness of these newly installed erosion control systems will be part of annual resource monitoring by HNF and PPL archaeologists.

As called for in the Charter Oak Mine and Mill historic preservation plan, building health-safety inspections led to the abatement and/or removal of toxic materials (arsenic, lead, asbestos) and building sanitation in the assay office and residence cabin in 2004. These buildings will be open for public visitation in 2005.

#### 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.

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 effort in the Ten Mile and Little Blackfoot River drainages, expose heritage resources to vandalism and artifact theft as a result of increased road access, visibility, and other factors. These projects should therefore be carefully monitored during and after construction, and access should be changed or made more challenging to abate and discourage heritage site depredation.

Recurrent impacts to some heritage sites have not been adequately addressed. Although some livestock control measures have been implemented, damage is still occurring to or threatens the Lewis and Clark National Historic Trail and related archaeological sites. Protection measures for highly significant heritage resources on the HNF need to be fully and effectively implemented, and then monitored.

Site vulnerability assessments to address threats from wildfire, vandalism and other events, and protection/abatement plans, should be developed for highly significant and fragile heritage resource properties on the forest. Historic preservation plans for significant heritage properties, such as the historic Moose Creek Ranger Station, should be developed and their management guidance followed.

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 should be converted to the INFRA data system to ensure better documentation and systematic tracking of multiyear monitoring work.

The HNF should continue to aggressively pursue heritage resource public outreach and education via *Passport in Time* and other volunteer projects, guided hikes and other educational events, and interpretive signing and other media. These efforts create greater public awareness of the value and importance of conserving heritage resources on the HNF.

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

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### **(T1) Economics**

#### Forest Plan Requirements:

Accurate cost data for timber sale appraisal, contracts, allotments, management plans, cost/output for various resource programs, sale area betterment plans, and timber sale reports are to be monitored.

#### *Intent:*

The intent is to verify unit cost used in the Plan compared to on-the-ground cost.

#### Current Efforts & Findings:

The T-1 monitoring element is on a 5-year reporting interval. The FY01 report included the T-1 information and reporting should again occur in FY06. Information is still compiled for all of the data sources specified for this monitoring requirement. The Forest maintains timber sale appraisals, contracts, sale area betterment plans, and timber sale reports. Various resource program managers also maintain Cost/output information and the individual districts maintain allotment management plans. The Helena National Forest records are available for review by interested parties.

In addition to information provided here, the Forest distributes an annual "Update" to a wide local audience and attaches a copy to each Annual Monitoring Report. The Update specifies a number of costs, receipts, and outputs.

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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.

#### 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 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.

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**(T3) All resources, effects of emerging issues or changing social values****Forest Plan Requirements:**

The effects of emerging issues or changing social values are to be monitored with the intent of keeping publics informed, through educational and environmental programs, and to raise FS awareness to public concerns. Action is initiated if issues cannot be dealt with under the Forest Plan.

**Current Efforts and Findings:**

The Forest now has an employee with dedicated responsibilities for community outreach. This person conducts a considerable volume of learning sessions with area students, hosts natural resource presentations by experts and discussion panels, and maintains contacts with elected officials. The Planning staff produces a Schedule of Proposed Actions on a quarterly basis and publics are further informed and invited to provide feedback through formal NEPA scoping, legal notices, news releases, display ads, and monitoring reports. One effort, which is underway at the present, is a multi-state, multi-agency effort to amend Forest Plans, including the Helena Plan, to incorporate guidance for lynx recovery. This is an example of an issue that cannot be adequately addressed with current Forest Plan guidance.

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

Action would be initiated if issues cannot be dealt with under the Forest Plan.

*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. As needed, Forest Plan amendments have been identified.

*Actions in response to variability assessment:*

Within variability, no action is required.

**Recommended Efforts:**

No recommendations at this time.

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**(T4) Evaluate lands identified as not meeting physical or biological characteristics.****Forest Plan Requirements:**

The FP requires annual review of EA's, ID Team evaluation, District assessments, and timber sale feasibility analyses with the objective of verifying allocations in the FP in terms of lands identified as not

meeting physical or biological characteristics. Reporting is to be done on a continual basis, and all changes to be evaluated annually.

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

Over the course of managing under the current Forest Plan, 20 plan amendments have been developed. Of these, six of the amendments made changes to management allocations. 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.

#### **Variability Discussion:**

##### *Variability Measure:*

Lands identified as not meeting physical or biological suitability characteristics, due to changed conditions or data errors, will be evaluated annually.

##### *Assessment:*

Data errors and biological and physical characteristics are typically identified during project specific analysis and through inventory and monitoring data gathering. 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 also addressed through a Forest Plan amendment.

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

Within variability, no action is required.

#### **Recommended Efforts:**

No recommendations at this time.